MMWR™
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr

Recommendations and Reports | June 18, 2010 / Vol. 59 / No. RR-4

U.S. Medical Eligibility Criteria for Contraceptive Use, 2010

Adapted from the World Health Organization Medical Eligibility Criteria for Contraceptive Use, 4th edition

Continuing Education Examination available at http://www.cdc.gov/mmwr/cme/conted.html

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

The *MMWR* series of publications is published by the Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested Citation: Centers for Disease Control and Prevention. [Title]. MMWR 2010;59(No. RR-#):[inclusive page numbers].

CONTENTS

Disclosure of Relationship

CDC, our planners, and our presenters wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters.

This document will not include any discussion of the unlabeled use of a product or a product under investigational use, with the exception that some of the recommendations included in this document may be inconsistent with package labeling.

There was no commercial support for this activity.

U S. Medical Eligibility Criteria for Contraceptive Use, 2010

Adapted from the World Health Organization Medical Eligibility Criteria for Contraceptive Use, 4th edition

Prepared by
Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion

Summary

CDC created U.S. Medical Eligibility Criteria for Contraceptive Use, 2010, from guidance developed by the World Health Organization (WHO) and finalized the recommendations after consultation with a group of health professionals who met in Atlanta, Georgia, during February 2009. This guidance comprises recommendations for the use of specific contraceptive methods by women and men who have certain characteristics or medical conditions. The majority of the U.S. guidance does not differ from the WHO guidance and covers >60 characteristics or medical conditions. However, some WHO recommendations were modified for use in the United States, including recommendations about contraceptive use for women with venous thromboembolism, valvular heart disease, ovarian cancer, and uterine fibroids and for postpartum and breastfeeding women. Recommendations were added to the U.S. guidance for women with rheumatoid arthritis, history of bariatric surgery, peripartum cardiomyopathy, endometrial hyperplasia, inflammatory bowel disease, and solid organ transplantation. The recommendations in this document are intended to assist health-care providers when they counsel women, men, and couples about contraceptive method choice. Although these recommendations are meant to serve as a source of clinical guidance, health-care providers should always consider the individual clinical circumstances of each person seeking family planning services.

Introduction

In 1996, the World Health Organization (WHO) published the first edition of the *Medical Eligibility Criteria for Contraceptive Use* (MEC), which gave evidence-based guidance on the safety of contraceptive method use for women and men worldwide who had specific characteristics and medical conditions. Since that time, WHO has regularly updated its guidance on the basis of new evidence, and the WHO MEC is now in its fourth edition (*1*).

CDC, through close collaboration with WHO, has contributed substantially during the last 15 years to creation of WHO's global family planning guidance, which includes four documents: the medical eligibility criteria for contraceptive use, the selected practice recommendations for contraceptive use, a decision-making tool for clients and providers, and a global family planning handbook. This WHO guidance has been based on the best available scientific evidence, and CDC has served as the lead for establishing that evidence base and presenting the evidence to WHO for use during its expert working group meetings to create and update the guidance.

WHO has always intended for its global guidance to be used by local or regional policy makers, managers of family planning programs, and the scientific community as a reference when they develop family planning guidance at the country or program level. The United Kingdom is one example of a country that has adapted the WHO MEC for its own use (*2*).

CDC undertook a formal process to adapt the WHO MEC at this time because the fourth edition of the WHO guidance is unlikely to undergo major revisions in the near future. Although the WHO guidance is already available in the United States through inclusion in textbooks, use by professional organizations, and incorporation into training programs, the adaptation of the guidance ensures its appropriateness for use in the United States and allows for further dissemination and implementation among U.S. health-care providers. Most of the U.S. guidance does not differ from the WHO guidance and covers approximately 60 characteristics or medical conditions. However, several changes have been made, including adaptations of selected WHO recommendations, addition of recommendations for new medical conditions, and removal of recommendations for contraceptive methods not currently available in the United States (Appendix A).

This document contains recommendations for health-care providers for the safe use of contraceptive methods by women and men with various characteristics and medical conditions. It is intended to assist health-care providers when they counsel women, men, and couples about contraceptive method choice. These recommendations are meant to be a source of clinical guidance; health-care providers should always consider the individual clinical circumstances of each person seeking family planning services.

Corresponding preparer: Kathryn M. Curtis, PhD, Division of Reproductive Health, CDC, MS K-34, 4770 Buford Highway NE, Atlanta, GA 30341; Telephone 770-488-6397; Fax: 770-488-6391; E-mail kmc6@cdc.gov

Methods

The process for adapting the WHO MEC for the United States comprised four major steps: 1) determination of the scope of and process for the adaptation, including a small meeting; 2) preparation and peer review of systematic reviews of the evidence to be used for the adaptation; 3) organization of a larger meeting to examine the evidence and provide input on the recommendations; and 4) finalization of the recommendations by CDC.

In June 2008, CDC held a 2-day meeting of eight key partners and U.S. family planning experts to determine the scope of and process for a U.S. adaptation of the WHO MEC. Participants were family planning providers, who also had expertise in conducting research on contraceptive safety and translating research evidence into guidance. WHO guidance is used widely around the world, including in the United States, and contains approximately 1,800 separate recommendations. In most cases, the evidence base would be the same for the U.S. and the WHO recommendation, and—because of the extensive collaboration between WHO and CDC in creating the international guidance—the process for determining the recommendations also would be the same. Therefore, CDC determined that the global guidance also should be the U.S. guidance, except when a compelling reason existed for adaptation, and that CDC would accept the majority of WHO guidance for use in the United States.

During the June 2008 meeting, CDC identified specific WHO recommendations for which a compelling reason existed to consider modification for the United States because of the availability of new scientific evidence or the context in which family planning services are provided in the United States. CDC also identified areas in which WHO guidance was inconsistent with current U.S. practice by contacting numerous professional and service organizations and individual providers. In addition, CDC assessed the need for adding recommendations for medical conditions not currently included in the WHO MEC. Through this process, a list was developed of existing WHO recommendations to consider adapting and new medical conditions to consider adding to the guidance.

A systematic review of the scientific evidence was conducted for each of the WHO recommendations considered for adaptation and for each of the medical conditions considered for addition to the guidance. The purpose of these systematic reviews was to identify direct evidence about the safety of contraceptive method use by women (or men) with selected conditions (e.g., risk for disease progression or other adverse health effects in women with rheumatoid arthritis who use combined oral contraceptives). Information about indirect evidence (e.g., evidence from healthy women or animal studies) or theoretical considerations was obtained when direct evidence was not available. CDC conducted systematic reviews following standard guidelines (*3,4*), included thorough searches of PubMed and other databases of the scientific literature, and used the U.S. Preventive Services Task Force system to grade the strength and quality of the evidence (*5*). Each systematic review was peer-reviewed by two or three experts before being used in the adaptation process. These systematic reviews have been submitted for publication in peer-reviewed journals.

For most recommendations in this document, a limited number of studies address the use of a specific contraceptive method by women with a specific condition. Therefore, within the WHO guidance, as well as with this U.S. adaptation of the guidance, most of the decisions about medical eligibility criteria were often necessarily based on 1) extrapolations from studies that primarily included healthy women, 2) theoretical considerations about risks and benefits, and 3) expert opinion. Evidence was particularly limited for newer contraceptive methods. The total body of evidence for each recommendation included evidence based on direct studies or observations of the contraceptive method used by women (or men) with the condition and may have included 1) evidence derived from effects of the contraceptive method used by women (or men) without the condition and 2) indirect evidence or theoretical concerns based on studies of suitable animal models, human laboratory studies, or analogous clinical situations.

In February 2009, CDC held a meeting of 31 experts who were invited to provide their individual perspective on the scientific evidence presented and the discussions on potential recommendations that followed. This group included obstetricians/gynecologists, pediatricians, family physicians, nurse-midwives, nurse practitioners, epidemiologists, and others with expertise in contraceptive safety and provision. For each topic discussed, the evidence from the systematic review was presented; for most of the topics, an expert in the specific medical condition (e.g., rheumatoid arthritis) also gave a brief presentation on the condition and specific issues about contraceptive safety. CDC gathered input from the experts during the meeting and finalized the recommendations in this document. CDC plans to develop a research agenda to address topics identified during the meeting that need further investigation.

How to Use This Document

These recommendations are intended to help health-care providers determine the safe use of contraceptive methods among women and men with various characteristics and medical conditions. Providers also can use the synthesis of information in these recommendations when consulting with women, men,

and couples about their selection of contraceptive methods. The tables in this document include recommendations for the use of contraceptive methods by women and men with particular characteristics or medical conditions. Each condition was defined as representing either an individual's characteristics (e.g., age, history of pregnancy) or a known preexisting medical/pathologic condition (e.g., diabetes and hypertension). The recommendations refer to contraceptive methods being used for contraceptive purposes; the recommendations do not consider the use of contraceptive methods for treatment of medical conditions because the eligibility criteria in these cases may differ. The conditions affecting eligibility for the use of each contraceptive method were classified under one of four categories (Box 1).

BOX 1. Categories of medical eligibility criteria for contraceptive use

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

Using the Categories in Practice

Health-care providers can use these categories when assessing the safety of contraceptive method use for women and men with specific medical conditions or characteristics. Category 1 comprises conditions for which no restrictions exist for use of the contraceptive method. Classification of a method/condition as Category 2 indicates the method generally can be used, but careful follow-up may be required. For a method/condition classified as Category 3, use of that method usually is not recommended unless other more appropriate methods are not available or acceptable. The severity of the condition and the availability, practicality, and acceptability of alternative methods should be taken into account, and careful follow-up will be required. Hence, provision of a method to a woman with a condition classified as Category 3 requires careful clinical judgement and access to clinical services. Category 4 comprises conditions that represent an unacceptable health risk if the method is used. For example, a smoker aged <35 years generally can use combined oral contraceptives (COCs) (Category 2). However, for a woman aged ≥35 years who smokes <15 cigarettes per day, the use of COCs usually is not recommended unless other methods are not available or acceptable to her (Category 3). A woman aged ≥35 years who smokes ≥15 cigarettes per day should not use COCs because of unacceptable health risks, primarily the risk for myocardial infarction and stroke (Category 4). The programmatic implications of these categories may depend on the circumstances of particular professional or service organizations (e.g., in some settings, a Category 3 may mean that special consultation is warranted).

The recommendations address medical eligibility criteria for the initiation and continued use of all methods evaluated. The issue of continuation criteria is clinically relevant whenever a woman develops the condition while she is using the method. When the categories differ for initiation and continuation, these differences are noted in the columns *Initiation* and *Continuation*. Where *Initiation* and *Continuation* are not denoted, the category is the same for initiation and continuation of use.

On the basis of this classification system, the eligibility criteria for initiating and continuing use of a specific contraceptive method are presented in tables (Appendices A–M). In these tables, the first column indicates the condition. Several conditions were divided into subconditions to differentiate between varying types or severity of the condition. The second column classifies the condition for initiation and/or continuation into Category 1, 2, 3, or 4. For some conditions, the numeric classification does not adequately capture the recommendation; in this case, the third column clarifies the numeric category. These clarifications were determined during the discussions of the scientific evidence and the numeric classification and are considered a necessary element of the recommendation. The third column also summarizes the evidence for the recommendation, where evidence exists. The recommendations for which no evidence is cited are based on expert opinion from either the WHO or U.S. expert working group meetings and may be based on evidence from sources other than systematic reviews and presented at those meetings. For selected recommendations, additional comments appear in the third column and generally come from the WHO or the U.S. expert working group participants.

Recommendations for Use of Contraceptive Methods

The classifications for whether women with certain medical conditions or characteristics can use specific contraceptive methods are provided for combined hormonal contraceptive methods, including low-dose (containing ≤35 μg ethi-

nyl estradiol) combined oral contraceptive pills, combined hormonal patch, and combined vaginal ring (Appendix B); progestin-only contraceptive methods, including progestin-only pills, depot medroxyprogesterone acetate injections, and etonogestrel implants (Appendix C); emergency contraceptive pills (Appendix D); intrauterine contraception, including the copper intrauterine device (IUD) and the levonorgestrel IUD (Appendix E); use of copper IUDs for emergency contraception (Appendix F); barrier contraceptive methods, including male and female condoms, spermicides, diaphragm with spermicide, and cervical cap (Appendix G); fertility awareness-based methods (Appendix H); lactational amenorrhea method (Appendix I); coitus interruptus (Appendix J); and female and male sterilization (Appendix K). Tables at the end of the document summarize the classifications for the hormonal and intrauterine methods (Appendix L) and the evidence about potential drug interactions between hormonal contraceptives and antiretroviral therapies (Appendix M).

Contraceptive Method Choice

Many elements need to be considered by women, men, or couples at any given point in their lifetimes when choosing the most appropriate contraceptive method. These elements include safety, effectiveness, availability (including accessibility and affordability), and acceptability. The guidance in this document focuses primarily on the safety of a given contraceptive method for a person with a particular characteristic or medical condition. Therefore, the classification of Category 1 means that the method can be used in that circumstance with no restrictions with regard to safety but does not necessarily imply that the method is the best choice for that person; other factors, such as effectiveness, availability, and acceptability, may play a key role in determining the most appropriate choice. Voluntary informed choice of contraceptive methods is an essential guiding principle, and contraceptive counseling, where applicable, may be an important contributor to the successful use of contraceptive methods.

In choosing a method of contraception, the risk for sexually transmitted infections (STIs), including human immunodeficiency virus (HIV), also must be considered. Although hormonal contraceptives and IUDs are highly effective at preventing pregnancy, they do not protect against STIs. Consistent and correct use of the male latex condom reduces the risk for STIs (*6*). When a male condom cannot be used properly for infection prevention, a female condom should be considered (*7*). Women who use contraceptive methods other than condoms should be counseled about the use of condoms and the risk for STIs (*7*). Additional information about prevention and treatment of STIs is available from CDC's *Sexually Transmitted Diseases Treatment Guidelines* (http://www.cdc.gov/std/treatment) (*7*).

Contraceptive Method Effectiveness

Contraceptive method effectiveness is critically important in minimizing the risk for unintended pregnancy, particularly among women for whom an unintended pregnancy would pose additional health risks. The effectiveness of contraceptive methods depends both on the inherent effectiveness of the method itself and on how consistently and correctly it is used (Table 1). Methods that depend on consistent and correct use have a wide range of effectiveness.

Unintended Pregnancy and Increased Health Risk

For women with conditions that may make unintended pregnancy an unacceptable health risk, long-acting, highly effective contraceptive methods may be the best choice (Table 1). Women with these conditions should be advised that sole use of barrier methods for contraception and behavior-based methods of contraception may not be the most appropriate choice because of their relatively higher typical-use rates of failure (Table 1). Conditions included in the U.S. MEC for which unintended pregnancy presents an unacceptable health risk are identified throughout the document (Box 2).

Keeping Guidance Up to Date

As with any evidence-based guidance document, a key challenge is keeping the recommendations up to date as new scientific evidence becomes available. CDC will continue to work with WHO to identify and assess all new relevant evidence and to determine whether changes to the recommendations are warranted (*4*). In most cases, the U.S. MEC will follow any updates in the WHO guidance, which typically occur every 3–4 years (or sooner if warranted by new data). However, CDC will review any WHO updates for their application in the United States. CDC also will identify and assess any new literature for the recommendations and medical conditions that are not included in the WHO guidance. CDC will completely review the U.S. MEC every 3–4 years as well. Updates to the guidance will appear on the CDC U.S. MEC website: http://www.cdc.gov/reproductivehealth/UnintendedPregnancy/USMEC.htm.

TABLE 1. Percentage of women experiencing an unintended pregnancy during the first year of typical use and the first year of perfect use of contraception and the percentage continuing use at the end of the first year — United States

	Women experiencing an unintended pregnancy within the first year of use		
Method	**Typical use***	**Perfect use†**	**Women continuing use at 1 year§**
No method¶	85%	85%	
Spermicides**	29%	18%	42%
Withdrawal	27%	4%	43%
Fertility awareness–based methods	25%		51%
Standard Days method††		5%	
TwoDay method™††		4%	
Ovulation method††		3%	
Sponge			
Parous women	32%	20%	46%
Nulliparous women	16%	9%	57%
Diaphragm§§	16%	6%	57%
Condom¶¶			
Female (Reality®)	21%	5%	49%
Male	15%	2%	53%
Combined pill and progestin-only pill	8%	0.3%	68%
Evra patch®	8%	0.3%	68%
NuvaRing®	8%	0.3%	68%
Depo-Provera®	3%	0.3%	56%
Intrauterine device			
ParaGard® (copper T)	0.8%	0.6%	78%
Mirena® (LNG-IUS)	0.2%	0.2%	80%
Implanon®	0.05%	0.05%	84%
Female sterilization	0.5%	0.5%	100%
Male sterilization	0.15%	0.10%	100%
Emergency contraceptive pills***	Not applicable	Not applicable	Not applicable
Lactational amenorrhea methods†††	Not applicable	Not applicable	Not applicable

Adapted from Trussell J. Contraceptive efficacy. In Hatcher RA, Trussell J, Nelson AL, Cates W, Stewart FH, Kowal D. Contraceptive technology. 19th revised ed. New York, NY: Ardent Media; 2007.

* Among typical couples who initiate use of a method (not necessarily for the first time), the percentage who experience an unintended pregnancy during the first year if they do not stop use for any other reason. Estimates of the probability of pregnancy during the first year of typical use for spermicides, withdrawal, fertility awareness-based methods, the diaphragm, the male condom, the pill, and Depo-Provera are taken from the 1995 National Survey of Family Growth corrected for underreporting of abortion; see the text for the derivation of estimates for the other methods.

† Among couples who initiate use of a method (not necessarily for the first time) and who use it *perfectly* (both consistently and correctly), the percentage who experience an unintended pregnancy during the first year if they do not stop use for any other reason. See the text for the derivation of the estimate for each method.

§ Among couples attempting to avoid pregnancy, the percentage who continue to use a method for 1 year.

¶ The percentages becoming pregnant in the typical use and perfect use columns are based on data from populations where contraception is not used and from women who cease using contraception to become pregnant. Of these, approximately 89% become pregnant within 1 year. This estimate was lowered slightly (to 85%) to represent the percentage who would become pregnant within 1 year among women now relying on reversible methods of contraception if they abandoned contraception altogether.

** Foams, creams, gels, vaginal suppositories, and vaginal film.

†† The TwoDay and Ovulation methods are based on evaluation of cervical mucus. The Standard Days method avoids intercourse on cycle days 8–19.

§§ With spermicidal cream or jelly.

¶¶ Without spermicides.

*** Treatment initiated within 72 hours after unprotected intercourse reduces the risk for pregnancy by at least 75%. The treatment schedule is 1 dose within 120 hours after unprotected intercourse and a second dose 12 hours after the first dose. Both doses of Plan B can be taken at the same time. Plan B (1 dose is 1 white pill) is the only dedicated product specifically marketed for emergency contraception. The Food and Drug Administration has in addition declared the following 22 brands of oral contraceptives to be safe and effective for emergency contraception: Ogestrel or Ovral (1 dose is 2 white pills); Levlen or Nordette (1 dose is 4 light-orange pills); Cryselle, Levora, Low-Ogestrel, Lo/Ovral, or Quasence (1 dose is 4 white pills); Tri-Levlen or Triphasil (1 dose is 4 yellow pills); Jolessa, Portia, Seasonale, or Trivora (1 dose is 4 pink pills); Seasonique (1 dose is 4 light blue-green pills); Empresse (1 dose is 4 orange pills); Alesse, Lessina, or Levlite (1 dose is 5 pink pills); Aviane (1 dose is 5 orange pills); and Lutera (1 dose is 5 white pills).

††† Lactational amenorrhea method is a highly effective *temporary* method of contraception. However, to maintain effective protection against pregnancy, another method of contraception must be used as soon as menstruation resumes, the frequency or duration of breastfeeding is reduced, bottle feeds are introduced, or the baby reaches 6 months of age.

BOX 2. Conditions associated with increased risk for adverse health events as a result of unintended pregnancy

- Breast cancer
- Complicated valvular heart disease
- Diabetes: insulin-dependent; with nephropathy/retinopathy/neuropathy or other vascular disease; or of >20 years' duration
- Endometrial or ovarian cancer
- Epilepsy
- Hypertension (systolic >160 mm Hg or diastolic >100 mm Hg)
- History of bariatric surgery within the past 2 years
- HIV/AIDS
- Ischemic heart disease
- Malignant gestational trophoblastic disease
- Malignant liver tumors (hepatoma) and hepatocellular carcinoma of the liver
- Peripartum cardiomyopathy
- Schistosomiasis with fibrosis of the liver
- Severe (decompensated) cirrhosis
- Sickle cell disease
- Solid organ transplantation within the past 2 years
- Stroke
- Systemic lupus erythematosus
- Thrombogenic mutations
- Tuberculosis

Acknowledgements

This report is based in part on the work of the Promoting Family Planning Team, Department of Reproductive Health and Research, World Health Organization, and its development of the *WHO Medical Eligibility Criteria for Contraceptive Use*, 4th edition.

References

1. WHO. Medical eligibility criteria for contraceptive use. 4th ed. Geneva: WHO; 2009. Available at http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/index.html.
2. Faculty of Family Planning and Reproductive Health Care, Royal College of Obstetricians and Gynecologists. UK medical eligibility criteria for contraceptive use, 2005–2006. London: Faculty of Family Planning and Reproductive Health Care, 2006.
3. Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. JAMA 2000;283:2008–12.
4. Mohllajee AP, Curtis KM, Flanagan RG, et al. Keeping up with evidence a new system for WHO's evidence-based family planning guidance. Am J Prev Med 2005;28:483–90.
5. Harris RP, Helfand M, Woolf SH, et al. Current methods of the US Preventive Services Task Force: a review of the process. Am J Prev Med 2001;20:21–35.
6. CDC. Condom fact sheet in brief. Available at http://www.cdc.gov/condomeffectiveness/docs/Condom_fact_Sheet_in_Brief.pdf.
7. CDC. Sexually transmitted diseases treatment guidelines, 2006. MMWR 2006;55(RR No. 11).

Appendix A

Summary of Changes to the World Health Organization Medical Eligibility Criteria for Contraceptive Use, 4th Edition, to Create the U.S. Medical Eligibility Criteria for Contraceptive Use, 2010

The classification additions, deletions, and modifications from the World Health Organization (WHO) Medical Eligibility Criteria for Contraceptive Use, 4th Edition, are summarized below (Tables 1–3). For conditions for which classification changed for ≥1 methods or the condition description underwent a major modification, WHO conditions and recommendations appear in curly brackets.

BOX. Categories for Classifying Hormonal Contraceptives and Intrauterine Devices

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE 1. Summary of changes in classifications from WHO Medical Eligibility Criteria for Contraceptive Use, 4th edition*†

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD	Cu-IUD	Clarification
Breastfeeding							
a. <1 mo postpartum {WHO: <6 wks postpartum}	3§ {4}	2§ {3}	2§ {3}	2§ {3}			The US Department of Health and Human Services recommends that infants be exclusively breastfed during the first 4–6 months of life, preferably for a full 6 months. Ideally, breastfeeding should continue through the first year of life (*1*). {Not included in WHO MEC}
b. 1 mo to <6 mos {WHO: ≥6 wks to <6 mos postpartum}	2§ {3}						
Postpartum (in breastfeeding or nonbreastfeeding women), including post caesarean section							
a. <10 min after delivery of the placenta {WHO: <48 hrs, including insertion immediately after delivery of the placenta}					2 {1 if not breastfeeding and 3 if breastfeeding}		
b. 10 min after delivery of the placenta to <4 wks {WHO: ≥48 hrs to <4 wks}					2 {3}	2{3}	
Deep venous thrombosis (DVT)/pulmonary embolism (PE)							
a. History of DVT/PE, not on anticoagulant therapy							
ii. Lower risk for recurrent DVT/PE (no risk factors)	3 {4}						
b. Acute DVT/PE		2 {3}	2 {3}	2 {3}	2 {3}	2 {1}	
c. DVT/PE and established on anticoagulant therapy for at least 3 mos							

TABLE 1. (*Continued*) Summary of changes in classifications from WHO Medical Eligibility Criteria for Contraceptive Use, 4th edition*†

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD	Cu-IUD	Clarification
i. Higher risk for recurrent DVT/PE (≥1 risk factors) • Known thrombophilia, including antiphospholipid syndrome • Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer • History of recurrent DVT/PE						2 {1}	
ii. Lower risk for recurrent DVT/PE (no risk factors)	3§ {4}					2 {1}	Women on anticoagulant therapy are at risk for gynecologic complications of therapy such as hemorrhagic ovarian cysts and severe menorrhagia. Hormonal contraceptive methods can be of benefit in preventing or treating these complications. When a contraceptive method is used as a therapy, rather than solely to prevent pregnancy, the risk/benefit ratio may be different and should be considered on a case-by-case basis. {Not included in WHO MEC}
Valvular heart disease							
b. Complicated¶ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)					1 {2}	1 {2}	
Ovarian cancer¶					1 {Initiation = 3, Continuation = 2}	1 {Initiation = 3, Continuation = 2}	
Uterine fibroids					2 {1 if no uterine distortion and 4 if uterine distortion is present}	2 {1 if no uterine distortion and 4 if uterine distortion is present}	

* For conditions for which classification changed for ≥1 methods or the condition description underwent a major modification, WHO conditions and recommendations appear in curly brackets.

† Abbreviations: WHO = World Health Organization; COC = combined oral contraceptive; P = combined hormonal contraceptive patch; R = combined hormonal vaginal ring; POP = progestin-only pill; DMPA = depot medroxyprogesterone acetate; LNG-IUD = levonorgestrel-releasing intrauterine device; Cu-IUD = copper intrauterine device; DVT = deep venous thrombosis; PE = pulmonary embolism; VTE = venous thromboembolism.

§ Consult the clarification column for this classification.

¶ Condition that exposes a women to increased risk as a result of unintended pregnancy.

TABLE 2. Summary of recommendations for medical conditions added to the U.S. Medical Eligibility Criteria for Contraceptive Use*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD		Cu-IUD		Clarification
					Initiation	Continuation	Initiation	Continuation	
History of bariatric surgery†									
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	1	1	1	1		1		
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	COCs: 3 P/R: 1	3	1	1	1		1		
Peripartum cardiomyopathy†									
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (2)									
i <6 mos	4	1	1	1	2		2		
ii ≥6 mos	3	1	1	1	2		2		
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (2)	4	2	2	2	2		2		
Rheumatoid arthritis									
a. On immunosuppressive therapy	2	1	2/3§	1	2	1	2	1	DMPA use among women on long-term corticosteroid therapy with a history of, or risk factors for, nontraumatic fractures is classified as Category 3. Otherwise, DMPA use for women with rheumatoid arthritis is classified as Category 2.
b. Not on immunosuppressive therapy	2	1	2	1	1		1		
Endometrial hyperplasia	1	1	1	1	1		1		
Inflammatory bowel disease (IBD) (ulcerative colitis, Crohn disease)	2/3§	2	2	1	1		1		For women with mild IBD, with no other risk factors for VTE, the benefits of COC/P/R use generally outweigh the risks (Category 2). However, for women with IBD with increased risk for VTE (e.g., those with active or extensive disease, surgery, immobilization, corticosteroid use, vitamin deficiencies, fluid depletion), the risks for COC/P/R use generally outweigh the benefits (Category 3).
Solid organ transplantation†									
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	4	2	2	2	3	2	3	2	
b. Uncomplicated	2§	2	2	2	2		2		Women with Budd-Chiari syndrome should not use COC/P/R because of the increased risk for thrombosis.

* Abbreviations: COC = combined oral contraceptive; P = combined hormonal contraceptive patch; R = combined hormonal vaginal ring: POP = progestin-only pill; DMPA = depot medroxyprogesterone acetate; LNG-IUD = levonorgestrel-releasing intrauterine device; Cu-IUD = copper intrauterine device; IBD = inflammatory bowel disease; VTE = venous thromboembolism.

† Condition that exposes a women to increased risk as a result of unintended pregnancy.

§ Consult the clarification column for this classification.

TABLE 3. Summary of additional changes to the U.S. Medical Eligibility Criteria for Contraceptive Use

Condition/Contraceptive method	Change
Emergency contraceptive pills	History of bariatric surgery, rheumatoid arthritis, inflammatory bowel disease, and solid organ transplantation were added to Appendix D and given a Category 1.
Barrier methods	For 6 conditions—history of bariatric surgery, peripartum cardiomyopathy, rheumatoid arthritis, endometrial hyperplasia, inflammatory bowel disease, and solid organ transplantation—the barrier methods are classified as Category 1.
Sterilization	In general, no medical conditions would absolutely restrict a person's eligibility for sterilization. Recommendations from the World Health Organization (WHO) Medical Eligibility Criteria for Contraceptive Use about specific settings and surgical procedures for sterilization are not included here. The guidance has been replaced with general text on sterilization.
Other deleted items	Guidance for combined injectables, levonorgestrel implants, and norethisterone enanthate has been removed because these methods are not currently available in the United States. Guidance for "blood pressure measurement unavailable" and "history of hypertension, where blood pressure CANNOT be evaluated (including hypertension in pregnancy)" has been removed.
Unintended pregnancy and increased health risk	The following conditions have been added to the WHO list of conditions that expose a woman to increased risk as a result of unintended pregnancy: history of bariatric surgery within the past 2 years, peripartum cardiomyopathy, and receiving a solid organ transplant within 2 years.

References

1. Office on Women's Health, US Department of Health and Human Services. HHS blueprint for action on breastfeeding. Washington, DC: US Department of Health and Human Services, Office on Women's Health; 2000.
2. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co; 1994.

Appendix B
Classifications for Combined Hormonal Contraceptives

Combined hormonal contraceptives (CHCs) include low-dose (containing ≤35 μg ethinyl estradiol [EE]) combined oral contraceptives (COCs), the combined hormonal patch, and the combined vaginal ring. The combined hormonal patch and vaginal ring are relatively new contraceptive methods. Limited information is available about the safety of these methods among women with specific medical conditions. Moreover, epidemiologic data on the long-term effects of the combined hormonal patch and the vaginal ring were not available for review. Evidence indicates that the combined hormonal patch and the combined vaginal ring provide comparable safety and pharmacokinetic profiles to COCs with similar hormone formulations (*1–33*). Pending further studies, the evidence available for recommendations about COCs applies to the recommendations for the combined hormonal patch and vaginal ring. Therefore, the patch and ring should have the same categories (Box) as COCs, except where noted. The assigned categories should, therefore, be considered a preliminary, best judgement, which will be reevaluated as new data become available. CHCs do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

BOX. Categories for Classifying Combined Hormonal Contraceptives

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Personal Characteristics and Reproductive History		
Pregnancy	Not applicable	**Clarification:** Use of COCs, P, or R is not required. There is no known harm to the woman, the course of her pregnancy, or the fetus if COCs, P, or R are inadvertently used during pregnancy.
Age		
a. Menarche to <40 yrs	1	**Evidence:** Adolescents using 20 μg EE-containing COCs have lower BMD than do nonusers, and higher dose-containing COCs have little to no effect. (*34–41*). In premenopausal adult women, COC use has little to no effect on bone health while appearing to preserve bone mass in perimenopausal women (*26,42–90*). Postmenopausal women who have ever used COCs have similar BMD to postmenopausal women who have never used COCs (*54,58,68,81,91–110*). BMD in adolescent or premenopausal women may not accurately predict postmenopausal fracture risk (*109,111–122*).
b. ≥40 yrs	2	**Comment:** The risk for cardiovascular disease increases with age and might increase with CHC use. In the absence of other adverse clinical conditions, CHCs can be used until menopause.
Parity		
a. Nulliparous	1	
b. Parous	1	
Breastfeeding		**Clarification:** The U.S. Department of Health and Human Services recommends that infants be exclusively breastfed during the first 4–6 months of life, preferably for a full 6 months. Ideally, breastfeeding should continue through the first year of life (*123*).
a. <1 mo postpartum	3	
b. 1 mo to <6 mos postpartum	2	
c. ≥6 mos postpartum	2	**Evidence:** Clinical studies demonstrate conflicting results about effects on milk volume in women exposed to COCs during lactation; no consistent effect on infant weight has been reported. Adverse health outcomes or manifestations of exogenous estrogen in infants exposed to CHCs through breast milk have not been demonstrated (*124–133*). In general, these studies are of poor quality, lack standard definitions of breastfeeding or outcome measures, and have not included premature or ill infants. Theoretical concerns about effects of CHCs on breast milk production are greater in the early postpartum period when milk flow is being established.

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Postpartum (in nonbreastfeeding women)		
a. <21 days	3	**Comment:** Theoretical concern exists about the association between CHC use up to 3 weeks postpartum and risk for thrombosis in the mother. Blood coagulation and fibrinolysis are essentially normalized by 3 weeks postpartum.
b. ≥21 days	1	
Postabortion		**Clarification:** COCs, P, or R may be started immediately postabortion.
a. First trimester	1	**Evidence:** Women who started taking COCs immediately after first trimester medical or surgical abortion did not experience more side effects or adverse vaginal bleeding outcomes or clinically significant changes in coagulation parameters than did women who used a placebo, an IUD, a nonhormonal contraceptive method, or delayed COC initiation (*134–140*). Limited evidence on women using the ring immediately after first trimester medical or surgical abortion found no serious adverse events and no infection related to use of the combined vaginal contraceptive ring during 3 cycles of follow-up postabortion (*141*).
b. Second trimester	1	
c. Immediate postseptic abortion	1	
Past ectopic pregnancy	1	**Comment:** The risk for future ectopic pregnancy is increased among women who have had an ectopic pregnancy in the past. CHCs protect against pregnancy in general, including ectopic gestation.
History of pelvic surgery	1	
Smoking		
a. Age <35 yrs	2	**Evidence:** COC users who smoked were at increased risk for cardiovascular diseases, especially myocardial infarction, than those who did not smoke. Studies also showed an increased risk for myocardial infarction with increasing number of cigarettes smoked per day (*142–153*).
b. Age ≥35 yrs		
i. <15 Cigarettes/day	3	
ii. ≥15 Cigarettes/day	4	
Obesity		
a. ≥30 kg/m^2 BMI	2	**Evidence:** Obese women who use COCs are more likely than obese women who do not use COCs to experience VTE. The absolute risk for VTE in healthy women of reproductive age is small. Limited evidence suggests that obese women who use COCs do not have a higher risk for acute myocardial infarction or stroke than do obese nonusers (*147,153–159*). Limited evidence is inconsistent about whether COC effectiveness varies by body weight or BMI (*160–165*). Limited evidence suggests obese women are no more likely to gain weight after 3 cycles of the vaginal ring or COC than overweight or normal weight women. A similar weight gain during the 3 months was noted between the COC group and the vaginal ring group across all BMI categories (*166*). The effectiveness of the patch decreased among women who weighed >90 kg; however, no association was found between pregnancy risk and BMI (*18*).
b. Menarche to <18 yrs and ≥30 kg/m^2 BMI	2	
History of bariatric surgery§		
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	**Evidence:** Limited evidence demonstrated no substantial decrease in effectiveness of oral contraceptives among women who underwent laparoscopic placement of an adjustable gastric band (*167*).
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	COCs: 3 P/R: 1	**Evidence:** Limited evidence demonstrated no substantial decrease in effectiveness of oral contraceptives among women who underwent a biliopancreatic diversion (*168*); however, evidence from pharmacokinetic studies reported conflicting results of oral contraceptive effectiveness among women who underwent a jejunoileal bypass (*169,170*). **Comment:** Bariatric surgical procedures involving a malabsorptive component have the potential to decrease oral contraceptive effectiveness, perhaps further decreased by postoperative complications, such as long-term diarrhea and/or vomiting.
Cardiovascular Disease		
Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, and hypertension)	3/4	**Clarification:** When a woman has multiple major risk factors, any of which alone would substantially increase her risk for cardiovascular disease, use of COCs, P, or R might increase her risk to an unacceptable level. However, a simple addition of categories for multiple risk factors is not intended; for example, a combination of two risk factors assigned a category 2 might not necessarily warrant a higher category.
Hypertension		
For all categories of hypertension, classifications are based on the assumption that no other risk factors exist for cardiovascular disease. When multiple risk factors do exist, risk for cardiovascular disease might increase substantially. A single reading of blood pressure level is not sufficient to classify a woman as hypertensive.		
a. Adequately controlled hypertension	3	**Clarification:** Women adequately treated for hypertension are at reduced risk for acute myocardial infarction and stroke compared with untreated women. Although no data exist, COC, P, or R users with adequately controlled and monitored hypertension should be at reduced risk for acute myocardial infarction and stroke compared with untreated hypertensive COC, P, or R users.
b. Elevated blood pressure levels (properly taken measurements)		

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
i. Systolic 140–159 mm Hg or diastolic 90–99 mm Hg	3	**Evidence:** Among women with hypertension, COC users were at higher risk than nonusers for stroke, acute myocardial infarction, and peripheral arterial disease (*142,144,151–153,155,171–186*).
ii. Systolic ≥160 mm Hg or diastolic ≥100 mm Hg§	4	Discontinuation of COCs in women with hypertension might improve blood pressure control (*187*).
c. Vascular disease	4	
History of high blood pressure during pregnancy (where current blood pressure is measurable and normal)	2	**Evidence:** Women with a history of high blood pressure in pregnancy, who also used COCs, had a higher risk for myocardial infarction and VTE than did COC users who did not have a history of high blood pressure during pregnancy. The absolute risks for acute myocardial infarction and VTE in this population remained small (*153,172,184–186,188–193*).
Deep venous thrombosis (DVT)/ Pulmonary embolism (PE)		
a. History of DVT/PE, not on anticoagulant therapy		
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	4	
• History of estrogen-associated DVT/PE		
• Pregnancy-associated DVT/PE		
• Idiopathic DVT/PE		
• Known thrombophilia, including antiphospholipid syndrome		
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer		
• History of recurrent DVT/PE		
ii. Lower risk for recurrent DVT/PE (no risk factors)	3	
b. Acute DVT/PE	4	
c. DVT/PE and established on anticoagulant therapy for at least 3 mos		
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	4	**Clarification:** Women on anticoagulant therapy are at risk for gynecologic complications of therapy, such as hemorrhagic ovarian cysts and severe menorrhagia. Hormonal contraceptive methods can be of benefit in preventing or treating these complications. When a contraceptive method is used as a therapy, rather than solely to prevent pregnancy, the risk/benefit ratio might differ and should be considered on a case-by-case basis.
• Known thrombophilia, including antiphospholipid syndrome		
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer		
• History of recurrent DVT/PE		
ii. Lower risk for recurrent DVT/PE (no risk factors)	3	**Clarification:** Women on anticoagulant therapy are at risk for gynecologic complications of therapy, such as hemorrhagic ovarian cysts and severe menorrhagia. Hormonal contraceptive methods can be of benefit in preventing or treating these complications. When a contraceptive method is used as a therapy, rather than solely to prevent pregnancy, the risk/benefit ratio may differ and should be considered on a case-by-case basis.
d. Family history (first-degree relatives)	2	**Comment:** Some conditions that increase the risk for DVT/PE are heritable.
e. Major surgery		
i. With prolonged immobilization	4	
ii. Without prolonged immobilization	2	
f. Minor surgery without immobilization	1	
Known thrombogenic mutations§ (e.g., factor V Leiden; prothrombin mutation; protein S, protein C, and antithrombin deficiencies)	4	**Clarification**: Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening. **Evidence:** Among women with thrombogenic mutations, COC users had a 2-fold to 20-fold higher risk for thrombosis than did nonusers (*159,194–216*).
Superficial venous thrombosis		
a. Varicose veins	1	**Comment:** Varicose veins are not risk factors for DVT/PE
b. Superficial thrombophlebitis	2	
Current and history of ischemic heart disease§	4	
Stroke§ (history of cerebrovascular accident)	4	

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Known hyperlipidemias	2/3	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening. Although some types of hyperlipidemias are risk factors for vascular disease, the category should be assessed according to the type, its severity, and the presence of other cardiovascular risk factors.
Valvular heart disease		
a. Uncomplicated	2	
b. Complicated§ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)	4	**Comment:** Among women with valvular heart disease, CHC use may further increase the risk for arterial thrombosis; women with complicated valvular heart disease are at greatest risk.
Peripartum cardiomyopathy§		
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (*217*)		**Evidence:** No direct evidence exists about the safety of COCs/P/R among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies of women with cardiac disease demonstrated few cases of hypertension and transient ischemic attack in women with cardiac disease using COCs. No cases of heart failure were reported (*218*). **Comment:** COCs might increase fluid retention in healthy women; fluid retention may worsen heart failure in women with peripartum cardiomyopathy. COCs might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.
i. <6 mos	4	
ii. ≥6 mos	3	
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (*217*)	4	**Evidence:** No direct evidence exists about the safety of COCs/P/R among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies of women with cardiac disease demonstrated few cases of hypertension and transient ischemic attack in women with cardiac disease using COCs. No cases of heart failure were reported (*218*). **Comment:** COCs might increase fluid retention in healthy women; fluid retention may worsen heart failure in women with peripartum cardiomyopathy. COCs might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.
Rheumatic Diseases		
Systemic lupus erythematosus (SLE)§		
Persons with SLE are at increased risk for ischemic heart disease, stroke, and VTE. Categories assigned to such conditions in the MEC should be the same for women with SLE who present with these conditions. For all categories of SLE, classifications are based on the assumption that no other risk factors for cardiovascular disease are present; these classifications must be modified in the presence of such risk factors.		
Many women with SLE can be considered good candidates for most contraceptive methods, including hormonal contraceptives (*219–237*).		
a. Positive (or unknown) antiphospholipid antibodies	4	**Evidence:** Antiphospholipid antibodies are associated with a higher risk for both arterial and venous thrombosis (*238,239*).
b. Severe thrombocytopenia	2	
c. Immunosuppressive treatment	2	
d. None of the above	2	
Rheumatoid arthritis		
a. On immunosuppressive therapy	2	**Evidence:** Limited evidence shows no consistent pattern of improvement or worsening of rheumatoid arthritis with use of oral contraceptives (*240–245*), progesterone (*246*), or estrogen (*247*).
b. Not on immunosuppressive therapy	2	
Neurologic Conditions		
Headaches	Initiation / Continuation	**Clarification:** Classification depends on accurate diagnosis of those severe headaches that are migrainous and those headaches that are not. Any new headaches or marked changes in headaches should be evaluated. Classification is for women without any other risk factors for stroke. Risk for stroke increases with age, hypertension and smoking.
a. Non-migrainous (mild or severe)	1 / 2	
b. Migraine		**Evidence:** Among women with migraine, women who also had aura had a higher risk for stroke than did those without aura (*248–250*). Women with a history of migraine who use COCs are about 2–4 times as likely to have an ischemic stroke as nonusers with a history of migraine (*142,157,179,180,249-254*). **Comment:** Aura is a specific focal neurologic symptom. For more information about this and other diagnostic criteria, see: Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders, 2nd ed. Cephalalgia. 2004;24(Suppl 1). Available http://www.i-h-s.org/upload/ct_clas/ihc_II_main_no_print.pdf.
i. Without aura		
• Age <35 yrs	2 / 3	
• Age ≥35 yrs	3 / 4	
ii. With aura, at any age	4 / 4	
Epilepsy§	1	**Clarification:** If a woman is taking anticonvulsants, refer to the section on drug interactions. Certain anticonvulsants lower COC effectiveness. The extent to which P or R use is similar to COC use in this regard remains unclear.

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Depressive Disorders		
Depressive disorders	1	**Clarification**: The classification is based on data for women with selected depressive disorders. No data on bipolar disorder or postpartum depression were available. Drug interactions potentially can occur between certain antidepressant medications and hormonal contraceptives. **Evidence**: COC use did not increase depressive symptoms in women with depression compared with baseline or with nonusers with depression (*255–264*).
Reproductive Tract Infections and Disorders		
Vaginal bleeding patterns		
a. Irregular pattern without heavy bleeding	1	**Comment:** Irregular menstrual bleeding patterns are common among healthy women.
b. Heavy or prolonged bleeding (includes regular and irregular patterns)	1	**Clarification:** Unusually heavy bleeding should raise suspicion of a serious underlying condition. **Evidence:** A Cochrane Collaboration Review identified 1 randomized controlled trial evaluating the effectiveness of COC use compared with naproxen and danazol in treating menorrhagic women. Women with menorrhagia did not report worsening of the condition or any adverse events related to COC use (*265*).
Unexplained vaginal bleeding (suspicious for serious condition)		
Before evaluation	2	**Clarification:** If pregnancy or an underlying pathological condition (such as pelvic malignancy) is suspected, it must be evaluated and the category adjusted after evaluation. **Comment:** No conditions that cause vaginal bleeding will be worsened in the short term by use of CHCs.
Endometriosis	1	**Evidence:** A Cochrane Collaboration Review identified 1 randomized controlled trial evaluating the effectiveness of COC use compared with a gonadotropin-releasing hormone analogue in treating the symptoms of endometriosis. Women with endometriosis did not report worsening of the condition or any adverse events related to COC use (*266*).
Benign ovarian tumors (including cysts)	1	
Severe dysmenorrhea	1	**Evidence:** Risk for side effects with COC use was not higher among women with dysmenorrhea than among women not using COCs. Some COC users had a reduction in pain and bleeding (*267,268*).
Gestational trophoblastic disease		
a. Decreasing or undetectable β–hCG levels	1	**Evidence:** After molar pregnancy evacuation, the balance of evidence found COC use did not increase the risk for postmolar trophoblastic disease, and β-hCG levels regressed more rapidly in some COC users than in nonusers (*269–275*). Limited evidence suggests that use of COCs during chemotherapy does not significantly affect the regression or treatment of postmolar trophoblastic disease compared with women who used a nonhormonal contraceptive method or DMPA during chemotherapy (*276*).
b. Persistently elevated β-hCG levels or malignant disease§	1	
Cervical ectropion	1	**Comment:** Cervical ectropion is not a risk factor for cervical cancer, and restriction of CHC use is unnecessary.
Cervical intraepithelial neoplasia	2	**Evidence:** Among women with persistent HPV infection, long-term COC use (≥5 years) might increase the risk for carcinoma in situ and invasive carcinoma (*21,277*). Limited evidence on women with low-grade squamous intraepithelial lesions found use of the vaginal ring did not worsen the condition (*21*).
Cervical cancer (awaiting treatment)	2	**Comment:** Theoretical concern exists that CHC use might affect prognosis of the existing disease. While awaiting treatment, women may use CHCs. In general, treatment of this condition can render a woman sterile.
Breast Disease		
a. Undiagnosed mass	2	**Clarification:** The woman should be evaluated as early as possible.
b. Benign breast disease	1	
c. Family history of cancer	1	**Evidence:** Women with breast cancer susceptibility genes (such as *BRCA1* and *BRCA2*) have a higher baseline risk for breast cancer than do women without these genes. The baseline risk for breast cancer is also higher among women with a family history of breast cancer than among those who do not have such a history. However, current evidence does not suggest that the increased risk for breast cancer among women with either a family history of breast cancer or breast cancer susceptibility genes is modified by the use of COCs (*278–295*).
d. Breast cancer§		
i. Current	4	**Comment:** Breast cancer is a hormonally sensitive tumor, and the prognosis for women with current or recent breast cancer might worsen with CHC use.
ii. Past and no evidence of current disease for 5 yrs	3	
Endometrial hyperplasia	1	
Endometrial cancer§	1	**Comment:** COC use reduces the risk for endometrial cancer; whether P or R use reduces the risk for endometrial cancer is not known. While awaiting treatment, women may use COCs, P, or R. In general, treatment of this condition renders a woman sterile.

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Ovarian cancer§	1	**Comment:** COC use reduces the risk for ovarian cancer; whether P or R use reduces the risk for ovarian cancer is not known. While awaiting treatment, women may use COCs, P, or R. In general, treatment of this condition can render a woman sterile.
Uterine fibroids	1	**Comment:** COCs do not appear to cause growth of uterine fibroids, and P and R also are not expected to cause growth.
Pelvic inflammatory disease (PID)		
a. Past PID (assuming no current risk factors for STIs)		**Comment:** COCs might reduce the risk for PID among women with STIs but do not protect against HIV or lower genital tract STIs. Whether use of P or R reduces the risk for PID among women with STIs is unknown, but they do not protect against HIV or lower genital tract STIs.
i. With subsequent pregnancy	1	
ii. Without subsequent pregnancy	1	
b. Current PID	1	
STIs		
a. Current purulent cervicitis or chlamydial infection or gonorrhea	1	
b. Other STIs (excluding HIV and hepatitis)	1	
c. Vaginitis (including *Trichomonas vaginalis* and bacterial vaginosis)	1	
d. Increased risk for STIs	1	**Evidence:** Evidence suggests that chlamydial cervicitis may be increased among COC users at high risk for STIs. For other STIs, there is either evidence of no association between COC use and STI acquisition or too limited evidence to draw any conclusions (*296–376*).
HIV/AIDS		
High risk for HIV	1	**Evidence:** The balance of the evidence suggests no association between oral contraceptive use and HIV acquisition, although findings from studies conducted among higher risk populations have been inconsistent (*377–415*).
HIV infection§	1	**Evidence:** Most studies suggest no increased risk for HIV disease progression with hormonal contraceptive use, as measured by changes in CD4 cell count, viral load, or survival. Studies observing that women with HIV who use hormonal contraception have increased risks of acquiring STIs are generally consistent with reports among uninfected women. One direct study found no association between hormonal contraceptive use and an increased risk for HIV transmission to uninfected partners; several indirect studies reported mixed results about whether hormonal contraception is associated with increased risk for HIV-1 DNA or RNA shedding from the genital tract (*377,416–432*).
AIDS§	1	**Clarification**: Drug interactions may occur between hormonal contraceptives and ARV therapy; refer to the section on drug interactions.
Other Infections		
Schistosomiasis		
a. Uncomplicated	1	**Evidence:** Among women with uncomplicated schistosomiasis, COC use had no adverse effects on liver function (*433–439*).
b. Fibrosis of liver§ (if severe, see cirrhosis)	1	
Tuberculosis§		**Clarification:** If a woman is taking rifampicin, refer to the section on drug interactions. Rifampicin is likely to decrease COC effectiveness. The extent to which P or R use is similar to COC use in this regard remains unclear.
a. Nonpelvic	1	
b. Pelvic	1	
Malaria	1	
Endocrine Conditions		
Diabetes		
a. History of gestational disease	1	**Evidence:** The development of noninsulin-dependant diabetes in women with a history of gestational diabetes is not increased by use of COCs (*440–447*). Likewise, lipid levels appear to be unaffected by COC use (*448–450*).
b. Nonvascular disease		**Evidence:** Among women with insulin- or noninsulin-dependent diabetes, COC use had limited effect on daily insulin requirements and no effect on long-term diabetes control (e.g., glycosylated hemoglobin levels) or progression to retinopathy. Changes in lipid profile and hemostatic markers were limited, and most changes remained within normal values (*451–460*).
i. Noninsulin-dependent	2	
ii. Insulin-dependent§	2	
c. Nephropathy/retinopathy/neuropathy§	3/4	**Clarification:** The category should be assessed according to the severity of the condition.
d. Other vascular disease or diabetes of >20 yrs' duration§	3/4	**Clarification:** The category should be assessed according to the severity of the condition.

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category		Clarifications/Evidence/Comments
Thyroid disorders			
a. Simple goiter	1		
b. Hyperthyroid	1		
c. Hypothyroid	1		
Gastrointestinal Conditions			
Inflammatory bowel disease (IBD) (ulcerative colitis, Crohn disease)	2/3		**Clarification:** For women with mild IBD and no other risk factor for VTE, the benefits of COC/P/R use generally outweigh the risks (Category 2). However, for women with IBD who are at increased risk for VTE (e.g., those with active or extensive disease, surgery, immobilization, corticosteroid use, vitamin deficiencies, or fluid depletion), the risks of COC/P/R use generally outweigh the benefits (Category 3). **Evidence:** Risk for disease relapse was not significantly higher among women with IBD using oral contraceptives (most studies did not specify formulation) than among nonusers (*461–465*). Absorption of COCs among women with mild ulcerative colitis and no or small ileal resections was similar to the absorption among healthy women (*466,467*). Findings might not apply to women with Crohn disease or more extensive bowel resections. No data exist that evaluate the increased risk for VTE among women with IBD using COCs/P/R. However, women with IBD are at higher risk than unaffected women for VTE (*468*).
Gallbladder disease			
a. Symptomatic			**Comment:** COCs, P, or R might cause a small increased risk for gallbladder disease. COCs, P, or R might worsen existing gallbladder disease.
i. Treated by cholecystectomy	2		
ii. Medically treated	3		
iii. Current	3		
b. Asymptomatic	2		
History of cholestasis			
a. Pregnancy-related	2		**Comment:** History of pregnancy-related cholestasis might predict an increased risk for COC-related cholestasis.
b. Past COC-related	3		**Comment:** History of COC-related cholestasis predicts an increased risk with subsequent COC use.
Viral hepatitis	Initiation	Continuation	
a. Acute or flare	3/4	2	**Clarification for initiation:** The category should be assessed according to the severity of the condition.
b. Carrier	1	1	**Evidence:** Data suggest that in women with chronic hepatitis, COC use does not increase the rate or severity of cirrhotic fibrosis, nor does it increase the risk for hepatocellular carcinoma (*469,470*). For women who are carriers, COC use does not appear to trigger liver failure or severe dysfunction (*471-473*). Evidence is limited for COC use during active hepatitis (*474*).
c. Chronic	1	1	
Cirrhosis			
a. Mild (compensated)	1		
b. Severe§ (decompensated)	4		
Liver tumors			
a. Benign			**Evidence:** Limited direct evidence suggests that hormonal contraceptive use does not influence either progression or regression of liver lesions among women with focal nodular hyperplasia (*475,476*).
i. Focal nodular hyperplasia	2		
ii. Hepatocellular adenoma§	4		
b. Malignant§ (hepatoma)	4		
Anemias			
Thalassemia	1		**Comment:** Anecdotal evidence from countries where thalassemia is prevalent indicates that COC use does not worsen the condition.
Sickle cell disease§	2		
Iron deficiency anemia	1		**Comment:** CHC use may decrease menstrual blood loss.
Solid Organ Transplantation			
Solid organ transplantation§			
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	4		**Evidence:** Limited evidence of COC and P users indicated no overall changes in biochemical measures. However, one study reported discontinuations of COC use in 2 (8%) of 26 women as a result of serious medical complications, and in one case report, a woman developed cholestasis associated with high-dose COC use (*477–480*).
b. Uncomplicated	2		**Clarification:** Women with Budd-Chiari syndrome should not use COC/P/R because of the increased risk for thrombosis. **Evidence:** Limited evidence of COC and P users indicated no overall changes in biochemical measures. However, one study reported discontinuations of COC use in 2 (8%) of 26 women as a result of serious medical complications, and in one case report, a woman developed cholestasis associated with high-dose COC use (*477–480*).

TABLE. (*Continued*) Classifications for combined hormonal contraceptives, including pill, patch, and ring*†

Condition	Category	Clarifications/Evidence/Comments
Drug Interactions		
Antiretroviral (ARV) therapy		**Clarification:** ARV drugs have the potential to either decrease or increase the bioavailability of steroid hormones in hormonal contraceptives. Limited data (summarized in Appendix M) suggest potential drug interactions between many ARV drugs (particularly some non-NNRTIs and ritonavir-boosted protease inhibitors) and hormonal contraceptives. These interactions might alter the safety and effectiveness of both the hormonal contraceptive and the ARV drug. Thus, if a woman on ARV treatment decides to initiate or continue hormonal contraceptive use, the consistent use of condoms is recommended to both prevent HIV transmission and compensate for any possible reduction in the effectiveness of the hormonal contraceptive. When a COC is chosen, a preparation containing a minimum of 30 μg EE should be used.
a. Nucleoside reverse transcriptase inhibitors (NRTIs)	1	
b. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	2	
c. Ritonavir-boosted protease inhibitors	3	
Anticonvulsant therapy		**Clarification:** Although the interaction of certain anticonvulsants with COCs, P, or R is not harmful to women, it is likely to reduce the effectiveness of COCs, P, or R. Use of other contraceptives should be encouraged for women who are long-term users of any of these drugs. When a COC is chosen, a preparation containing a minimum of 30 μg EE should be used.
a. Certain anticonvulsants (phenytoin, carbamazepine, barbiturates, primidone, topiramate, oxcarbazepine)	3	**Evidence:** Use of certain anticonvulsants might decrease the effectiveness of COCs (*481–484*).
b. Lamotrigine	3	**Clarification:** The recommendation for lamotrigine applies only for situations where lamotrigine monotherapy is taken concurrently with COCs. Anticonvulsant treatment regimens that combine lamotrigine and nonenzyme-inducing antiepileptic drugs (such as sodium valproate) do not interact with COCs. **Evidence:** Pharmacokinetic studies show levels of lamotrigine decrease significantly during COC use (*485–489*). Some women who used both COCs and lamotrigine experienced increased seizure activity in one trial (*485*).
Antimicrobial therapy		
a. Broad-spectrum antibiotics	1	**Evidence:** Most broad-spectrum antibiotics do not affect the contraceptive effectiveness of COCs(*490–526*), P (*527*) or R (*528*).
b. Antifungals	1	**Evidence:** Studies of antifungal agents have shown no clinically significant pharmacokinetic interactions with COCs (*529–538*) or R (*539*).
c. Antiparasitics	1	**Evidence:** Studies of antiparasitic agents have shown no clinically significant pharmacokinetic interactions with COCs (*433,540–544*).
d. Rifampicin or rifabutin therapy	3	**Clarification:** Although the interaction of rifampicin or rifabutin therapy with COCs, P, or R is not harmful to women, it is likely to reduce the effectiveness of COCs, P, or R. Use of other contraceptives should be encouraged for women who are long-term users of either of these drugs. When a COC is chosen, a preparation containing a minimum of 30 μg EE should be used. **Evidence:** The balance of the evidence suggests that rifampicin reduces the effectiveness of COCs (*545–560*). Data on rifabutin are limited, but effects on metabolism of COCs are less than with rifampicin, and small studies have not shown evidence of ovulation (*547,554*).

* Abbreviations: STI = sexually transmitted infection; HIV = human immunodeficiency virus; COC = combined oral contraceptive; P = patch; R = ring; EE = ethinyl estradiol; BMD = bone mineral density; CHC = combined hormonal contraceptive; IUD = intrauterine device; VTE = venous thromboembolism; BMI = body mass index; DVT = deep venous thrombosis; PE = pulmonary embolism; SLE = systemic lupus erythematosus; MEC = Medical Eligibility Criteria; hCG = human chorionic gonadotropin; DMPA = depot medroxyprogesterone acetate; HPV = human papillomavirus; PID = pelvic inflammatory disease; AIDS = acquired immunodeficiency syndrome; ARV = antiretroviral; IBD = inflammatory bowel disease; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase inhibitor.

† COCs/P/R do not protect against STI/HIV. If risk for STI/HIV (including during pregnancy or postpartum) exists, the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STI/HIV transmission.

§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

References

1. Abrams LS, Skee D, Natarajan J, Wong FA, Lasseter KC. Multiple-dose pharmacokinetics of a contraceptive patch in healthy women participants. Contraception 2001;64:287–94.
2. Audet M-C, Moreau M, Koltun WD, et al. Evaluation of contraceptive efficacy and cycle control of a transdermal contraceptive patch vs. an oral contraceptive: a randomized trial. JAMA 2001;285:2347–54.
3. Boonyarangkul A, Taneepanichskul S. Comparison of cycle control and side effects between transdermal contraceptive patch and an oral contraceptive in women older than 35 years. J Med Assoc Thai 2007;90:1715–9.
4. Burkman RT. The transdermal contraceptive patch: a new approach to hormonal contraception. Int J Fertil 2002;47:69–76.
5. Cole JA, Norman H, Doherty M, Walker AM. Venous thromboembolism, myocardial infarction, and stroke among transdermal contraceptive system users. Obstet Gynecol 2007;109:339–46.
6. Devineni D, Skee D, Vaccaro N, et al. Pharmacokinetics and pharmacodynamics of a transdermal contraceptive patch and an oral contraceptive. J Clin Pharmacol 2007;47:497–509.
7. Dittrich R, Parker L, Rosen JB, et al. Transdermal contraception: evaluation of three transdermal norelgestromin/ethinyl estradiol doses in a randomized, multicenter, dose-response study. Am J Obstet Gynecol 2002;186:15–20.
8. Helmerhorst FM, Cronje HS, Hedon B, et al. Comparison of efficacy, cycle control, compliance and safety in users of a contraceptive patch vs. an oral contraceptive. Int J Gynaecol Obstet 2000;70:78.
9. Jick S, Kaye J, Li L, Jick H. Further results on the risk of nonfatal venous thromboembolism in users of the contraceptive transdermal patch compared to users of oral contraceptives containing norgestimate and 35 μg of ethinyl estradiol. Contraception 2007;76:4–7.

10. Jick SS, Jick H. Cerebral venous sinus thrombosis in users of four hormonal contraceptives: levonorgestrel-containing oral contraceptives, norgestimate-containing oral contraceptives, desogestrel-containing oral contraceptives and the contraceptive patch. Contraception 2006;74:290–2.
11. Jick SS, Kaye J, Russmaann S, Jick H. Risk of nonfatal venous thromboembolism in women using a contraceptive transdermal patch and oral contraceptives containing norgestimate and 35 microg of ethinyl estradiol. Contraception 2006;73:223–8.
12. Jick SS, Jick H. The contraceptive patch in relation to ischemic stroke and acute myocardial infarction. Pharmacotherapy 2007;27:218–20.
13. Pierson RA, Archer DF, Moreau M, et al. Ortho EvraEvra versus oral contraceptives: follicular development and ovulation in normal cycles and after an intentional dosing error. Fertil Steril 2003;80:34–42.
14. Radowicki S, Skorzeqska K, Szlendak K. Safety evaluation of a transdermal contraceptive system with an oral contraceptive. Ginekologia Polska 2005;76:884–9.
15. Smallwood GH, Meador ML, Lenihan JP, et al. Efficacy and safety of a transdermal contraceptive system. Obstet Gynecol 2001;98:799–805.
16. Urdl W, Apter D, Alperstein A, et al. Contraceptive efficacy, compliance and beyond: factors related to satisfaction with once-weekly transdermal compared with oral contraception. Eur J Obstet Gynecol Reprod Biol 2005;121:202–10.
17. White T, Ozel B, Jain JK, Stanczyk FZ. Effects of transdermal and oral contraceptives on estrogen-sensitive hepatic proteins. Contraception 2006;74:293–6.
18. Zieman M, Guillebaud JG, Weisberg E, et al. Contraceptive efficacy and cycle control with the Ortho Evra/Evra transdermal system: the analysis of pooled data. Fertil Steril 2002;77:s13–s18.
19. Ahrendt HJ, Nisand I, Bastianelli C, et al. Efficacy, acceptability and tolerability of the combined contraceptive ring, NuvaRing, compared with an oral contraceptive containing 30 microg of ethinyl estradiol and 3 mg of drospirene. Contraception 2006;74:451–7.
20. Bjarnadottir RI, Tuppurainen M, Killick SR. Comparison of cycle control with a combined contraceptive vaginal ring and oral levonorgestrel/ethinyl estradiol. Am J Obstet Gynecol 2002;186:389–95.
21. Dieben T, Roumen FJ, Apter D. Efficacy, cycle control, and user acceptibility of a novel combined contraceptive vaginal ring. Obstet Gynecol 2002;100:585–93.
22. Duijkers I, Killick SR, Bigrigg A, et al. A comparative study on the effects of a contraceptive vaginal ring NuvaRing and an oral contraceptive on carbohydrate metabolism and adrenal and thyroid function. Eur J Contracept Reprod Health Care 2004;9:131–40.
23. Duijkers I, Klipping C, Verhoeven CH, et al. Ovarian function with the contraceptive vaginal ring or an oral contraceptive: a randomized study. Hum Reprod 2004;19:2668–73.
24. Elkind-Hirsch KE, Darensbourg C, Ogden B, et al. Contraceptive vaginal ring use for women has less adverse metabolic effets than an oral contraceptive. Contraception 2007;76:348–56.
25. Magnusdottir EM, Bjarnadottir RI, Onundarson PT, et al. The contraceptive vaginal ring (NuvaRing) and hemostasis: a comparative study. Contraception 2004;69:461–7.
26. Massai R, Makarainen L, Kuukankorpi A, Klipping C, Duijkers I, Dieben T. The combined contraceptive vaginal ring and bone mineral density in healthy pre-menopausal women. Hum Reprod 2005;20:2764–8.
27. Milsom I, Lete I, Bjertnaes A, et al. Effects on cycle control and bodyweight of the combined contraceptive ring, NuvaRing, versus an oral contraceptive containing 30 microg ethinyl estradiol and 3 mg drospirenone. Hum Reprod 2006;21:2304–11.
28. Oddsson K, Leifels-Fischer B, de Melo NR, et al. Efficacy and safety of a contraceptive vaginal ring (NuvaRing) compared with a combined oral contraceptive: a 1-year randomized trial. Contraception 2005;71:176–82.
29. Sabatini R, Cagiano R. Comparison profiles of cycle control, side effects and sexual satisfaction of three hormonal contraceptives. Contraception 2006;74:220–3.
30. Timmer CJ, Mulders TM. Pharmacokinetics of etonogestrel and ethinylestradiol released from a combined contraceptive vaginal ring. Clin Pharmacokinet 2000;39:233–42.
31. Tuppurainen M, Klimscheffskij R, Venhola M, et al. The combined contraceptive vaginal ring (NuvaRing) and lipid metabolism: a comparative study. Contraception 2004;69:389–94.
32. van den Heuvel MW, van Bragt AJM, Alnabawy AKM, Kaptein MCJ. Comparison of ethylestradiol pharmacokinetics in three hormonal contraceptive formulations: the vaginal ring, the transdermal patch and an oral contraceptive. Contraception 2005;72:168–74.
33. Veres S, Miller L, Burington B. A comparison between the vaginal ring and oral contraceptives. Obstet Gynecol 2004;104:555–63.
34. Beksinska ME, Kleinschmidt I, Smit JA, Farley TM. Bone mineral density in adolescents using norethisterone enanthate, depot-medroxyprogesterone acetate or combined oral contraceptives for contraception. Contraception 2007;75:438–43.
35. Cromer BA, Blair JM, Mahan JD, Zibners L, Naumovski Z. A prospective comparison of bone density in adolescent girls receiving depot medroxyprogesterone acetate (Depo-Provera), levonorgestrel (Norplant), or oral contraceptives. J Pediatr 1996;129:671–6.
36. Cromer BA, Stager M, Bonny A, et al. Depot medroxyprogesterone acetate, oral contraceptives and bone mineral density in a cohort of adolescent girls. J Adolesc Health 2004;35:434–41.
37. Lara-Torre E, Edwards CP, Perlman S, Hertweck SP. Bone mineral density in adolescent females using depot medroxyprogesterone acetate. J Pediatr Adolesc Gynecol 2004;17:17–21.
38. Lloyd T, Taylor DS, Lin HM, et al. Oral contraceptive use by teenage women does not affect peak bone mass: a longitudinal study. Fertil Steril 2000;74:734–8.
39. Lloyd T, Petit MA, Lin HM, Beck TJ. Lifestyle factors and the development of bone mass and bone strength in young women. J Pediatr 2004;144:776–82.
40. Polatti F, Perotti F, Filippa N, Gallina D, Nappi RE. Bone mass and long-term monophasic oral contraceptive treatment in young women. Contraception 1995;51:221–4.
41. Wallace LS, Ballard JE. Lifetime physical activity and calcium intake related to bone density in young women. J Womens Health Gend Based Med 2002;11:389–98.
42. Afghani A, Abbott AV, Wiswell RA, et al. Bone mineral density in Hispanic women: role of aerobic capacity, fat-free mass, and adiposity. Int J Sports Med 2004;25:384–90.
43. Bahamondes L, Juliato CT, Villarreal M, et al. Bone mineral density in users of two kinds of once-a-month combined injectable contraceptives. Contraception 2006;74:259–63.
44. Berenson AB, Radecki CM, Grady JJ, Rickert VI, Thomas A. A prospective, controlled study of the effects of hormonal contraception on bone mineral density. Obstet Gynecol 2001;98:576–82.
45. Berenson AB, Breitkopf CR, Grady JJ, Rickert VI, Thomas A. Effects of hormonal contraception on bone mineral density after 24 months of use. Obstet Gynecol 2004;103:899–906.
46. Burr DB, Yoshikawa T, Teegarden D, et al. Exercise and oral contraceptive use suppress the normal age-related increase in bone mass and strength of the femoral neck in women 18–31 years of age. Bone 2000;27:855–63.
47. Castelo-Branco C, Martinez de Osaba MJ, Pons F, Vanrell JA. Effects on bone mass of two oral contraceptives containing ethinylestradiol and cyproterone acetate or desogestrel: results of a 2-year follow-up. Eur J Contracept Reprod Health Care 1998;3:79–84.
48. Cobb KL, Kelsey JL, Sidney S, Ettinger B, Lewis CE. Oral contraceptives and bone mineral density in white and black women in CARDIA. Coronary Risk Development in Young Adults. Osteoporos Int 2002;13:893–900.
49. Collins C, Thomas K, Harding A, et al. The effect of oral contraceptives on lumbar bone density in premenopausal women. J La State Med Soc 1988;140:35–9.

50. de Papp AE, Bone HG, Caulfield MP, et al. A cross-sectional study of bone turnover markers in healthy premenopausal women. Bone 2007;40:1222–30.
51. Elgan C, Samsioe G, Dykes AK. Influence of smoking and oral contraceptives on bone mineral density and bone remodeling in young women: a 2-year study. Contraception 2003;67:439–47.
52. Elgan C, Dykes AK, Samsioe G. Bone mineral density changes in young women: a two year study. Gynecol Endocrinol 2004;19:169–77.
53. Endrikat J, Mih E, Dusterberg B, et al. A 3-year double-blind, randomized, controlled study on the influence of two oral contraceptives containing either 20 microg or 30 microg ethinylestradiol in combination with levonorgestrel on bone mineral density. Contraception 2004;69:179–87.
54. Fortney JA, Feldblum PJ, Talmage RV, Zhang J, Godwin SE. Bone mineral density and history of oral contraceptive use. J Reprod Med 1994;39:105–9.
55. Garnero P, Sornay-Rendu E, Delmas PD. Decreased bone turnover in oral contraceptive users. Bone 1995;16:499–503.
56. Goldsmith N, Johnston J. Bone mineral: effects of oral contraceptives, pregnancy, and lactation. J Bone Joint Surg (American) 1975;57–A:657–68.
57. Hall ML, Heavens J, Cullum ID, Ell PJ. The range of bone density in normal British women. Br J Radiol 1990;63:266–9.
58. Hansen M, Overgaard K, Riis B, Christiansen C. Potential risk factors for development of postmenopausal osteoporosis—examined over a 12-year period. Osteoporos Int 1991;1:95–102.
59. Hartard M, Bottermann P, Bartenstein P, Jeschke D, Schwaiger M. Effects on bone mineral density of low-dosed oral contraceptives compared to and combined with physical activity. Contraception 1997;55:87–90.
60. Hartard M, Kleinmond C, Wiseman M, Weissenbacher ER, Felsenberg D, Erben RG. Detrimental effect of oral contraceptives on parameters of bone mass and geometry in a cohort of 248 young women. Bone 2007;40:444–50.
61. Hawker GA, Forsmo S, Cadarette SM, et al. Correlates of forearm bone mineral density in young Norwegian women: The Nord-Trondelag health study. Am J Epidemiol 2002;156:01.
62. Hreshchyshyn MM, Hopkins A, Zylstra S, Anbar M. Associations of parity, breast-feeding, and birth control pills with lumbar spine and femoral neck bone densities. Am J Obstet Gynecol 1988;159:318–22.
63. Kanders B, Lindsay R, Dempster D, Markhard L, Valiquette G. Determinants of bone mass in young healthy women. In: Christiansen, C Arnaud CD, Nordin BEC, Parfitt AM, Peck WA, Riggs BL, eds. Osteoporosis: proceedings of the Copenhagen Symposium on Osteoporosis. Copenhagen: Department of Clinical Chemistry, Glostrup Hospital: 1984:337–40.
64. Kleerekoper M, Brienza RS, Schultz LR, Johnson CC. Oral contraceptive use may protect against low bone mass. Henry Ford Hospital Osteoporosis Cooperative Research Group. Arch Intern Med 1991;151:1971–6.
65. Kritz-Silverstein D, Barrett-Connor E. Bone mineral density in postmenopausal women as determined by prior oral contraceptive use. Am J Public Health 1993;83:100–2.
66. Laitinen K, Valimaki M, Keto P. Bone mineral density measured by dual-energy X-ray absorptiometry in healthy Finnish women. Calcif Tissue Int 1991;48:224–31.
67. Lau EMC, Lynn H, Woo J, Melton III LJ. Areal and volumetric bone density in Hong Kong Chinese: A comparison with Caucasians living in the United States. Osteoporos Int 2003;14:01.
68. Lindsay R, Tohme J, Kanders B. The effect of oral contraceptive use on vertebral bone mass in pre- and post-menopausal women. Contraception 1986;34:333–40.
69. Lloyd T, Buchanan JR, Ursino GR, et al. Long-term oral contraceptive use does not affect trabecular bone density. Am J Obstet Gynecol 1989;160:402–4.
70. MacDougall J, Davies MC, Overton CE, et al. Bone density in a population of long term oral contraceptive pill users does not differ from that in menstruating women. Br J Fam Plann 1999;25:96–100.
71. Mais V, Fruzzetti F, Ajossa S, et al. Bone metabolism in young women taking a monophasic pill containing 20 mcg ethinylestradiol: a prospective study. Contraception 1993;48:445–52.
72. Masaryk P, Lunt M, Benevolenskaya L, et al. Effects of menstrual history and use of medications on bone mineral density: the EVOS Study. Calcif Tissue Int 1998;63:271–6.
73. Mazess RB, Barden HS. Bone density in premenopausal women: effects of age, dietary intake, physical activity, smoking, and birth-control pills. Am J Clin Nutr 1991;53:132–42.
74. Melton III LJ, Bryant SC, Wahner HW, et al. Influence of breastfeeding and other reproductive factors on bone mass later in life. Osteoporos Int 1993;3:76–83.
75. Murphy S, Khaw KT, Compston JE. Lack of relationship between hip and spine bone mineral density and oral contraceptive use. Eur J Clin Invest 1993;23:108–11.
76. Nappi C, Di Spiezio SA, Acunzo G, et al. Effects of a low-dose and ultra–low-dose combined oral contraceptive use on bone turnover and bone mineral density in young fertile women: a prospective controlled randomized study. Contraception 2003;67:355–9.
77. Nappi C, Di Spiezio SA, Greco E, et al. Effects of an oral contraceptive containing drospirenone on bone turnover and bone mineral density. Obstet Gynecol 2005;105:53–60.
78. Nelson M, Mayer AB, Rutherford O, Jones D. Calcium intake, physical activity and bone mass in pre-menopausal women. J Hum Nutr Diet 1991;4:171–8.
79. Ott SM, Scholes D, LaCroix AZ, et al. Effects of contraceptive use on bone biochemical markers in young women. J Clin Endocrinol Metab 2001;86:179–85.
80. Paoletti AM, Orru M, Lello S, et al. Short-term variations in bone remodeling markers of an oral contraception formulation containing 3 mg of drospirenone plus 30 microg of ethinyl estradiol: observational study in young postadolescent women. Contraception 2004;70:293–8.
81. Pasco JA, Kotowicz MA, Henry MJ, et al. Oral contraceptives and bone mineral density: A population-based study. Am J Obstet Gynecol 2000;182:265–9.
82. Perrotti M, Bahamondes L, Petta C, Castro S. Forearm bone density in long-term users of oral combined contraceptives and depot medroxyprogesterone acetate. Fertil Steril 2001;76:469–73.
83. Petitti DB, Piaggio G, Mehta S, Cravioto MC, Meirik O. Steroid hormone contraception and bone mineral density: a cross-sectional study in an international population. The WHO Study of Hormonal Contraception and Bone Health. Obstet Gynecol 2000;95:736–44.
84. Picard D, Ste-Marie LG, Coutu D, et al. Premenopausal bone mineral content relates to height, weight and calcium intake during early adulthood. Bone Miner 1988;4:299–309.
85. Prior JC, Kirkland SA, Joseph L, et al. Oral contraceptive use and bone mineral density in premenopausal women: cross-sectional, population-based data from the Canadian Multicentre Osteoporosis Study. Can Med Assoc J 2001;165:1023–9.
86. Recker RR, Davies KM, Hinders SM, et al. Bone gain in young adult women. JAMA 1992;268:2403–8.
87. Reed SD, Scholes D, LaCroix AZ, et al. Longitudinal changes in bone density in relation to oral contraceptive use. Contraception 2003;68:177–82.
88. Rodin A, Chapman M, Fogelman I. Bone density in users of combined oral contraception. Preliminary reports of a pilot study. Br J Fam Plann 1991;16:125–9.
89. Shoepe HA, Snow CM. Oral contraceptive use in young women is associated with lower bone mineral density than that of controls. Osteoporos Int 2005;16:1538–44.
90. Stevenson JC, Lees B, Devenport M, Cust MP, Ganger KF. Determinants of bone density in normal women: risk factors for future osteoporosis? BMJ 1989;298:924–8.

91. Beksinska M, Smit J, Kleinschmidt I, Farley T, Mbatha F. Bone mineral density in women aged 40–49 years using depot-medroxyprogesterone acetate, norethisterone enanthate or combined oral contraceptives for contraception. Contraception 2005;71:170–5.
92. Berning B, van KC, Schutte HE, et al. Determinants of lumbar bone mineral density in normal weight, non-smoking women soon after menopause. A study using clinical data and quantitative computed tomography. Bone Miner 1993;21:129–39.
93. Forsmo S, Schei B, Langhammer A, Forsen L. How do reproductive and lifestyle factors influence bone density in distal and ultradistal radius of early postmenopausal women? The Nord-Trondelag Health Survey, Norway. Osteoporos Int 2001;12:222–9.
94. Gambacciani M, Spinetti A, Taponeco F, et al. Longitudinal evaluation of perimenopausal vertebral bone loss: effects of a low-dose oral contraceptive preparation on bone mineral density and metabolism. Obstet Gynecol 1994;83:392–6.
95. Gambacciani M, Spinetti A, Cappagli B, et al. Hormone replacement therapy in perimenopausal women with a low dose oral contraceptive preparation: effects on bone mineral density and metabolism. Maturitas 1994;19(2):25–31).
96. Gambacciani M, Cappagli B, Ciaponi M, Benussi C, Genazzani AR. Hormone replacement therapy in perimenopause: effect of a low dose oral contraceptive preparation on bone quantitative ultrasound characteristics. Menopause 1999;6:43–8.
97. Gambacciani M, Ciaponi M, Cappagli B, Benussi C, Genazzani AR. Longitudinal evaluation of perimenopausal femoral bone loss: effects of a low-dose oral contraceptive preparation on bone mineral density and metabolism. Osteoporos Int 2000;11:544–8.
98. Gambacciani M, Cappagli B, Lazzarini V, et al. Longitudinal evaluation of perimenopausal bone loss: effects of different low dose oral contraceptive preparations on bone mineral density. Maturitas 2006;54:176–80.
99. Grainge MJ, Coupland CAC, Cliffe SJ, Chilvers CED, Hosking DJ. Reproductive, menstrual and menopausal factors: which are associated with bone mineral density in early postmenopausal women? Osteoporos Int 2001;12:777–87.
100. Johnell O, Nilsson BE. Life-style and bone mineral mass in perimenopausal women. Calcif Tissue Int 1984;36:354–6.
101. Liu SL, Lebrun CM. Effect of oral contraceptives and hormone replacement therapy on bone mineral density in premenopausal and perimenopausal women: a systematic review. Br J Sports Med 2006;40:11–24.
102. Progetto Menopausa Italia Study Group. Risk of low bone density in women attending menopause clinics in Italy. Maturitas 2002;42:105–11.
103. Shargil AA. Hormone replacement therapy in perimenopausal women with a triphasic contraceptive compound: a three-year prospective study. Int J Fertil 1985;30.
104. Sowers MF, Wallace RB, Lemke JH. Correlates of forearm bone mass among women during maximal bone mineralization. Prev Med 1985;14:585–96..
105. Sultana S, Choudhury S, Choudhury SA. Effect of combined oral contraceptives on bone mineral density in pre and postmenopausal women. Mymensingh Med J 2002;11:12–4.
106. Taechakraichana N, Limpaphayom K, Ninlagarn T, et al. A randomized trial of oral contraceptive and hormone replacement therapy on bone mineral density and coronary heart disease risk factors in postmenopausal women. Obstet Gynecol 2000;95:87–94.
107. Taechakraichana N, Jaisamrarn U, Panyakhamlerd K, Chaikittisilpa S, Limpaphayom K. Difference in bone acquisition among hormonally treated postmenopausal women with normal and low bone mass. J Med Assoc Thai 2001;84 Suppl 2:S586–S592.
108. Tavani A, La Vecchia C, Franceschi S. Oral contraceptives and bone mineral density. Am J Obstet Gynecol 2001;184:249–50.
109. Tuppurainen M, Kroger H, Saarikoski S, Honkanen R, Alhava E. The effect of previous oral contraceptive use on bone mineral density in perimenopausal women. Osteoporos Int 1994;4:93-8.
110. Volpe A, Amram A, Cagnacci A, Battaglia C. Biochemical aspects of hormonal contraception: effects on bone metabolism. Eur J Contracept Reprod Health Care 1997;2:123-6.
111. Barad D, Kooperberg C, Wactawski-Wende J, et al. Prior oral contraception and postmenopausal fracture: a Women's Health Initiative observational cohort study. Fertil Steril 2005;84:374–83.
112. Cobb KL, Bachrach LK, Sowers M, et al. The effect of oral contraceptives on bone mass and stress fractures in female runners. Med Sci Sports Exerc 2007;39:1464–73.
113. Cooper C, Hannaford P, Croft P, Kay CR. Oral contraceptive pill use and fractures in women: a prospective study. Bone 1993;14:41–5.
114. Johansson C, Mellstrom D. An earlier fracture as a risk factor for new fracture and its association with smoking and menopausal age in women. Maturitas 1996;24:97–106.
115. La Vecchia C, Tavani A, Gallus S. Oral contraceptives and risk of hip fractures. Lancet 1999;354:335–6.
116. Mallmin H, Ljunghall S, Persson I, Bergstrom R. Risk factors for fractures of the distal forearm: a population-based case-control study. Osteoporos Int 1994;4:298–304.
117. Michaelsson K, Baron JA, Farahmand BY, Persson I, Ljunghall S. Oral-contraceptive use and risk of hip fracture: a case-control study. Lancet 1999;353:1481–4.
118. Michaelsson K, Baron JA, Farahmand BY, Ljunghall S. Influence of parity and lactation on hip fracture risk. Am J Epidemiol 2001;153:1166–72.
119. O'Neill TW, Marsden D, Adams JE, Silman AJ. Risk factors, falls, and fracture of the distal forearm in Manchester, UK. J Epidemiol Community Health 1996;50:288–92.
120. O'Neill TW, Silman AJ, Naves DM, et al. Influence of hormonal and reproductive factors on the risk of vertebral deformity in European women. European Vertebral Osteoporosis Study Group. Osteoporos Int 1997;7:72–8.
121. Vessey M, Mant J, Painter R. Oral contraception and other factors in relation to hospital referral for fracture. Findings in a large cohort study. Contraception 1998;57:231–5.
122. Vestergaard P, Rejnmark L, Mosekilde L. Oral contraceptive use and risk of fractures. Contraception 2006;73:571–6.
123. Office on Women's Health, US Department of Health and Human Services. HHS blueprint for action on breastfeeding. Washington, DC: US Department of Health and Human Services, Office on Women's Health; 2000.
124. Kaern T. Effect of an oral contraceptive immediately post partum on initiation of lactation. Br Med J 1967;3:644–5.
125. Miller GH, Hughes LR. Lactation and genital involution effects of a new low-dose oral contraceptive on breast-feeding mothers and their infants. Obstet Gynecol 1970;35:44–50.
126. Gambrell RD. Immediate postpartum oral contraception. Obstet Gynecol 1970;36:101–6.
127. Guiloff E, Ibarrapo A, Zanartu J, et al. Effect of contraception on lactation. Am J Obstet Gynecol 1974;118:42–5.

128. Diaz S, Peralta O, Juez G, et al. Fertility regulation in nursing women. 3. Short-term influence of a low-dose combined oral-contraceptive upon lactation and infant growth. Contraception 1983;27:1–11.
129. Croxatto HB, Diaz S, Peralta O, et al. Fertility regulation in nursing women. 4. Long-term influence of a low-dose combined oral-contraceptive initiated at day 30 postpartum upon lactation and infant growth. Contraception 1983;27:13–25.
130. Peralta O, Diaz S, Juez G, et al. Fertility regulation in nursing women. 5. Long-term nfluence of a low-dose combined oral-contraceptive initiated at day 90 postpartum upon lactation and infant growth. Contraception 1983;27:27–38.
131. World Health Organization Special Programme of Research Development and Research Training in Human Reproduction. Effects of hormonal contraceptives on milk volume and infant growth. Contraception 1984;30:505–22.
132. Nilsson S, Melbin T, Hofvander Y, et al. Long-term follow-up of children breast-fed by women using oral contraceptives. Contraception 1986;34:443–53.
133. World Health Organization Task Force on Oral Contraceptives Special Programme of Research Development and Research Training in Human Reproduction. Effects of hormonal contraceptives on breast milk composition and infant growth. Stud Fam Plann 1988;19:361–9.
134. Lahteenmaki P. Influence of oral contraceptives on immediate postabortal pituitary-ovarian function. Acta Obstet Gynecol Scand 1978;Suppl 76:1–43.
135. Lahteenmaki P, Rasi V, Luukkainen T, Myllyä G. Coagulation factors in women using oral contraceptives or intrauterine contraceptive devices immediately after abortion. Am J Obstet Gynecol 1981;141:175–9.
136. Martin CW, Brown AH, Baird DT. A pilot study of the effect of methotrexate or combined oral contraceptive on bleeding patterns after induction of abortion with mifepristone and a prostaglandin pessary. Contraception 1998;58:99–103.
137. Niswonger JWH, London GD, Anderson GV, Wolfe L. Oral contraceptives during immediate postabortal period. Obstet Gynecol 1968;32:325–7.
138. Peterson WF. Contraceptive therapy following therapeutic abortion. Obstet Gynecol 1974;44:853–7.
139. Tang OS, et al. A randomized double-blind placebo-controlled study to assess the effect of oral contraceptive pills on the outcome of medical abortion with mifepristone and misoprostol. Hum Reprod 1999;14:722–5.
140. Tang OS, Gao PP, Cheng L, Lee SW, Ho PC. The effect of contraceptive pills on the measured blood loss in medical termination of pregnancy by mifepristone and misoprostol: a randomized placebo controlled trial. Hum Reprod 2002;17:99–102.
141. Fine PM, Tryggestad J, Meyers NJ, Sangi-Haghpeykar H. Safety and acceptability with the use of a contraceptive vaginal ring after surgical or medical abortion. Contraception 2007;75:367–71.
142. Gillum LA, Mamidipudi SK, Johnston SC. Ischaemic stroke risk with oral contraceptives: a meta-analysis. JAMA 2000;284:72–8.
143. Jick SS, Walker AM, Stergachis A, Jick H. Oral contraceptives and breast cancer. Br J Cancer 1989;59:618–21.
144. Khader YS, Rice J, John L, Abueita O. Oral contraceptive use and the risk of myocardial infarction: a meta-analysis. Contraception 2003;68:11–7.
145. Lawson DH, Davidson JF, Jick H. Oral contraceptive use and venous thromboembolism: absence of an effect of smoking. BMJ 1977;2:729–30.
146. Lidegaard O, Edstrom B, Kreiner S. Oral contraceptives and venous thromboembolism. A case-control study. Contraception 1998;57:291–301.
147. Nightingale AL, Lawrenson RA, Simpson EL, Williams TJ, MacRae KD, Farmer RD. The effects of age, body mass index, smoking and general health on the risk of venous thromboembolism in users of combined oral contraceptives. Eur J Contracept Reprod Health Care 2000;5:265–74.
148. Petitti D, Wingerd J, Pellegrin F, Ramcharan S. Risk of vascular disease in women. Smoking, oral contraceptives, noncontraceptive estrogens, and other factors. JAMA 1979;242:1150–4.
149. Rosenberg L, Palmer JR, Rao RS, Shapiro S. Low-dose oral contraceptive use and the risk of myocardial infarction. Arch Intern Med 2001;161:1065–70.
150. Straneva P, Hinderliter A, Wells E, Lenahan H, Girdler S. Smoking, oral contraceptives, and cardiovascular reactivity to stress. Obstet Gynecol 2000;95:78–83.
151. Tanis BC, van den Bosch MA, Kemmeren JM, et al. Oral contraceptives and the risk of myocardial infarction. N Engl J Med 2001;345:1787–93.
152. van den Bosch MA, Kemmeren JM, Tanis BC, et al. The RATIO study: oral contraceptives and the risk of peripheral arterial disease in young women. J Thromb Haemost 2003;1:439–44.
153. World Health Organization. Venous thromboembolic disease and combined oral contraceptives: results of international multicentre case-control study. Lancet 1995;346:1575–82.
154. Abdollahi M, Cushman M, Rosendaal FR. Obesity: risk of venous thrombosis and the interaction with coagulation factor levels and oral contraceptive use. Thromb Haemost 2003;89:493–8.
155. Lidegaard O, Edstrom B, Kreiner S. Oral contraceptives and venous thromboembolism: a five-year national case-control study. Contraception 2002;65:187–96.
156. Pomp ER, le CS, Rosendaal FR, Doggen CJ. Risk of venous thrombosis: obesity and its joint effect with oral contraceptive use and prothrombotic mutations. Br J Haematol 2007;139:289–96.
157. Schwartz SM, Petitti DB, Siscovick DS, et al. Stroke and use of low-dose oral contraceptives in young women: a pooled analysis of two US studies. Stroke 1998;29:2277–84.
158. Sidney S, Siscovick DS, Petitti DB, et al. Myocardial infarction and use of low-dose oral contraceptives: a pooled analysis of 2 US studies. Circulation 1998;98:1058–63.
159. Sidney S, Petitti DB, Soff GA, et al. Venous thromboembolic disease in users of low-estrogen combined estrogen-progestin oral contraceptives. Contraception 2004;70:3–10.
160. Brunner Huber LR, Hogue CJ, Stein AD, Drews C, Zieman M. Body mass index and risk for oral contraceptive failure: a case-cohort study in South Carolina. Ann Epidemiol 2006;16:637–43.
161. Brunner Huber LR, Toth JL. Obesity and oral contraceptive failure: findings from the 2002 National Survey of Family Growth. Am J Epidemiol 2007;166:1306–11.
162. Brunner LR, Hogue CJ. The role of body weight in oral contraceptive failure: results from the 1995 National Survey of Family Growth. Ann Epidemiol 2005;15:492–9.
163. Holt VL, Cushing-Haugen KL, Daling JR. Body weight and risk of oral contraceptive failure. Obstet Gynecol 2002;99:820–7.
164. Holt VL, Scholes D, Wicklund KG, Cushing-Haugen KL, Daling JR. Body mass index, weight, and oral contraceptive failure risk. Obstet Gynecol 2005;105:46–52.

165. Vessey M. Oral contraceptive failures and body weight: findings in a large cohort study. J Fam Plann Reprod Health Care 2001;27:90–1.
166. O'Connell KJ, Osborne LM, Westoff C. Measured and reported weight change for women using a vaginal contraceptive ring vs. a low-dose oral contraceptive. Contraception 2005;72:323–7.
167. Weiss HG, Nehoda H, Labeck B, et al. Pregnancies after adjustable gastric banding. Obes Surg 2001;11:303–6.
168. Gerrits EG, Ceulemans R, van HR, Hendrickx L, Totte E. Contraceptive treatment after biliopancreatic diversion needs consensus. Obes Surg 2003;13:378–82.
169. Victor A, Odlind V, Kral JG. Oral contraceptive absorption and sex hormone binding globulins in obese women: effects of jejunoileal bypass. Gastroenterol Clin North Am 1987;16:483–91.
170. Andersen AN, Lebech PE, Sorensen TI, Borggaard B. Sex hormone levels and intestinal absorption of estradiol and D-norgestrel in women following bypass surgery for morbid obesity. Int J Obes 1982;6:91–6.
171. Collaborative Group for the Study of Stroke in Young Women. Oral contraceptives and stroke in young women: associated risk factors. JAMA 1975;231:718–22.
172. Croft P, Hannaford P. Risk factors for acute myocardial infarction in women: evidence from the Royal College of General Practitioners' Oral Contraception Study. BMJ 1989;298:165–8.
173. D'Avanzo B, La Vecchia C, Negri E, Parazzini F, Franceschi S. Oral contraceptive use and risk of myocardial infarction: an Italian case-control study. J Epidemiol Community Health 1994;48:324–8.
174. Dunn NR, Faragher B, Thorogood M, et al. Risk of myocardial infarction in young female smokers. Heart 1999;82:581–3.
175. Hannaford P, Croft P, Kay CR. Oral contraception and stroke: evidence from the Royal College of General Practitioners' Oral Contraception Study. Stroke 1994;25:935–42.
176. Heinemann LA, Lewis MA, Spitzer WO, Thorogood M, Guggenmoos-Holzmann I, Bruppacher R. Thromboembolic stroke in young women. A European case-control study on oral contraceptives. Contraception 1998;57:29–37.
177. Kemmeren JM, Tanis BC, van den Bosch MA, et al. Risk of Arterial Thrombosis in Relation to Oral Contraceptives (RATIO) study: oral contraceptives and the risk of ischemic stroke. Stroke 2002;33:1202–8.
178. Lewis MA, Heinemann LA, Spitzer WO, MacRae KD, Bruppacher R. The use of oral contraceptives and the occurrence of acute myocardial infarction in young women. Results from the Transnational Study on Oral Contraceptives and the Health of Young Women. Contraception 1997;56:129–40.
179. Lidegaard O. Oral contraception and risk of a cerebral thromboembolic attack: results of a case-control study. BMJ 1993;306:956–63.
180. Lidegaard O. Oral contraceptives, pregnancy and the risk of cerebral thromboembolism: the influence of diabetes, hypertension, migraine and previous thrombotic disease. Br J Obstet Gynaecol 1995;102:153–9.
181. Lubianca JN, Faccin CS, Fuchs FD. Oral contraceptives: a risk factor for uncontrolled blood pressure among hypertensive women. Contraception 2003;67:19–24.
182. Narkiewicz K, Graniero GR, D'Este D, Mattarei M, Zonzin P, Palatini P. Ambulatory blood pressure in mild hypertensive women taking oral contraceptives. A case-control study. Am J Hypertens 1995;8:249–53.
183. Siritho S, Thrift AG, McNeil JJ, et al. Risk of ischemic stroke among users of the oral contraceptive pill: The Melbourne Risk Factor Study (MERFS) Group. Stroke 2003;34:1575–80.
184. World Health Organization. Haemorrhagic stroke, overall stroke risk, and combined oral contraceptives: results of an international, multicentre, case-control study. WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. Lancet 1996;348:505–10.
185. World Health Organization. Ischaemic stroke and combined oral contraceptives: results of an international, multicentre, case-control study. WHO Collaborative Study on Cardiovascular Disease and Steroid Hromone Contraception. Lancet 1996;348:498–505.
186. World Health Organization. Acute myocardial infarction and combined oral contraceptives: results of an international multicentre case-control study. WHO Collaborative Study on Cardiovascular Disease and Steroid Hormone Contraception. Lancet 1997;349:1202–9.
187. Lubianca JN, Moreira LB, Gus M, Fuchs FD. Stopping oral contraceptives: an effective blood pressure-lowering intervention in women with hypertension. J Hum Hypertens 2005;19:451–5.
188. Aberg H, Karlsson L, Melander S. Studies on toxaemia of pregnancy with special reference to blood pressure. II. Results after 6–11 years' follow-up. Ups J Me Sci 1978;83:97–102.
189. Carmichael SM, Taylor MM, Ayers CR. Oral contraceptives, hypertension, and toxemia. Obstet Gynecol 1970;35:371–6.
190. Meinel H, Ihle R, Laschinski M. Effect of hormonal contraceptives on blood pressure following pregnancy-induced hypertension [in German]. Zentralbl Gynäkol 1987;109:527–31.
191. Pritchard JA, Pritchard SA. Blood pressure response to estrogen-porgestin oral contraceptive after pregnancy-induced hypertension. Am J Obstet Gynecol 1977;129:733–9.
192. Sibai BM, Taslimi MM, el-Nazer A, Amon E, Mabie BC, Ryan GM. Maternal-perinatal outcome associated with the syndrome of hemolysis, elevated liver enzymes, and low platelets in severe preeclampsia-eclampsia. Am J Obstet Gynecol 1986;155:501–9.
193. Sibai BM, Ramadan MK, Chari RS, Friedman SA. Pregnancies complicated by HELLP syndrome (hemolysis, elevated liver enzymes, and low platelets): subsequent pregnancy outcome and long-term prognosis. Am J Obstet Gynecol 1995;172:125–9.
194. Anderson BS, Olsen J, Nielsen GL, et al. Third generation oral contraceptives and heritable thrombophilia as risk factors of non-fatal venous thromboembolism. Thromb Haemost 1998;79:28–31.
195. Aznar J, Mira Y, Vaya A, et al. Factor V Leiden and prothrombin G20210A mutations in young adults with cryptogenic ischemic stroke. Thromb Haemost 2004;91:1031–4.
196. Bennet L, Odeberg H. Resistance to activated protein C, highly prevalent amongst users of oral contraceptives with venous thromboembolism. J Intern Med 1998;244:27–32.
197. Bloemenkamp KW, Rosendaal FR, Helmerhorst FM, et al. Enhancement by factor V Leiden mutation of risk of deep-vein thrombosis associated with oral contraceptives containing a third-generation progestagen [comment]. Lancet 1995;346:1593–6.
198. Bloemenkamp KW, Rosendaal FR, Helmerhorst FM, et al. Higher risk of venous thrombosis during early use of oral contraceptives in women with inherited clotting defects [comment]. Arch Intern Med 2000;160:49–52.
199. de Bruijn SF, Stam J, Koopman MM, et al. Case-control study of risk of cerebral sinu thrombosis in oral contraceptive users and in [correction of who are] carriers of heriditary prothrombotic conditions. The Cerebral Venous Sinus Thrombosis Study Group. BMJ 1998;316:589–92.

200. Emmerich J, Rosendaal FR, Cattaneo M, et al. Combined effect of factor V Leiden and prothrombin 20210A on the risk of venous thromboembolism—pooled analysis of 8 case-control studies including 2310 cases and 3204 controls. Study Group for Pooled-Analysis in Venous Thromboembolism. Thromb Haemost 2001;86:809–16.
201. Gadelha T, Andre C, Juca AA, et al. Prothrombin 20210A and oral contraceptive use as risk factors for cerebral venous thrombosis. Cerebrovasc Dis 2005;19:49–52.
202. Legnani C, Palareti G, Guazzaloca G, et al. Venous thromboembolism in young women: role of thrombophilic mutations and oral contraceptive use. Eur Heart J 2002;23:984–90.
203. Martinelli I, Sacchi E, Landi G, et al. High risk of cerebral-vein thrombosis in carriers of a prothrombin-gene mutation and in users of oral contraceptives [comment]. N Eng J Med 1998;338:1793–7.
204. Martinelli I, Taioli E, Bucciarelli P, et al. Interaction between the G20210A mutation of the prothrombin gene and oral contraceptive use in deep vein thrombosis. Arterioscler Thromb Vasc Biol 1999;19:700–3.
205. Martinelli I, Battaglioli T, Bucciarelli P, et al. Risk factors and recurrence rate of primary deep vein thrombosis of the upper extremities. Circulation 2004;110:566–70.
206. Martinelli I, Battaglia C, Burgo I, et al. Oral contraceptive use, thrombophilia and their interaction in young women with ischemic stroke. Haematologica 2006;91:844–7.
207. Middeldorp S, Meinardi JR, Koopman MM, et al. A prospective study of asymptomatic carriers of the factor V Leiden mutation to determine the incidence of venous thromboembolism [comment]. Ann Intern Med 2001;135:322–7.
208. Pabinger I, Schneider B. Thrombotic risk of women with hereditary antithrombin lll-, protein C- and protein S-deficiency taking oral contraceptive medication. The GTH Study Group on Natural Inhibitors. Thromb Haemost 1994;71:548–52.
209. Pezzini A, Grassi M, Iacoviello L, et al. Inherited thrombophilia and stratification of ischaemic stroke risk among users of oral contraceptives. J Neurol Neurosurg Psychiatry 2007;78:271–6.
210. Santamaria A, Mateo J, Oliver A, et al. Risk of thrombosis associated with oral contraceptives of women from 97 families with inherited thrombophilia: high risk of thrombosis in carriers of the G20210A mutation of the prothrombin gene. Haematologica 2001;86:965–71.
211. Slooter AJ, Rosendaal FR, Tanis BC, et al. Prothrombotic conditions, oral contraceptives, and the risk of ischemic stroke. J Thromb Haemost 2005;3:1213–7.
212. Spannagl M, Heinemann LA, Schramm W. Are factor V Leiden carriers who use oral contraceptives at extreme risk of venous thromboembolism? Eur J Contracept Reprod Health Care 2000;5:105–12.
213. van Boven HH, Vandenbroucke JP, Briet E, et al. Gene-gene and gene-environment interactions determine risk of thrombosis in families with inherited antithrombin deficiency. Blood 1999;94:2590–4.
214. van Vlijmen EF, Brouwer JL, Veeger NJ, et al. Oral contraceptives and the absolute risk of venous thromboembolism in women with single or multiple thrombophilic defects: results from a retrospective family cohort study. Arch Intern Med 2007;167:282–9.
215. Vandenbroucke JP, Koster T, Briet E, et al. Increased risk of venous thrombosis in oral-contraceptive users who are carriers of factor V Leiden mutation [comment]. Lancet 1994;344:1453–7.
216. Vaya AM. Prothrombin G20210A mutation and oral contraceptive use increase upper-extremity deep vein thrombotic risk. Thromb Haemost 2003;89:452–7.
217. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co; 1994.
218. Avila WS, Grinberg M, Melo NR, Aristodemo PJ, Pileggi F. Contraceptive use in women with heart disease [in Portuguese]. Arq Bras Cardiol 1996;66:205–11.
219. Bernatsky S, Ramsey-Goldman R, Gordon C, et al. Factors associated with abnormal Pap results in systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1386–9.
220. Bernatsky S, Clarke A, Ramsey-Goldman R, et al. Hormonal exposures and breast cancer in a sample of women with systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1178–81.
221. Chopra N, Koren S, Greer WL, et al. Factor V Leiden, prothrombin gene mutation, and thrombosis risk in patients with antiphospholipid antibodies. J Rheumatol 2002;29:1683–8.
222. Esdaile JM, Abrahamowicz M, Grodzicky T, et al. Traditional Framingham risk factors fail to fully account for accelerated atherosclerosis in systemic lupus erythematosus. Arthritis Rheum 2001;44:2331–7.
223. Julkunen HA. Oral contraceptives in systemic lupus erythematosus: side-effects and influence on the activity of SLE. Scand J Rheumatol 1991;20:427–33.
224. Julkunen HA, Kaaja R, Friman C. Contraceptive practice in women with systemic lupus erythematosus. Br J Rheumatol 1993;32:227–30.
225. Jungers P, Dougados M, Pelissier C, et al. Influence of oral contraceptive therapy on the activity of systemic lupus erythematosus. Arthritis Rheum 1982;25:618–23.
226. Manzi S, Meilahn EN, Rairie JE, et al. Age-specific incidence rates of myocardial infarction and angina in women with systemic lupus erythematosus: comparison with the Framingham Study. Am J Epidemiol 1997;145:408–15.
227. McAlindon T, Giannotta L, Taub N, et al. Environmental factors predicting nephristis in systemic lupus erythematosus. Ann Rheum Dis 1993;52:720–4.
228. McDonald J, Stewart J, Urowitz MB, et al. Peripheral vascular disease in patients with systemic lupus erythematosus. Ann Rheum Dis 1992;51:56–60.
229. Mintz G, Gutierrez G, Deleze M, et al. Contraception with progestogens in systemic lupus erythematosus. Contraception 1984;30:29–38.
230. Petri M. Musculoskeletal complications of systemic lupus erythematosus in the Hopkins Lupus Cohort: an update. Arthritis Care Res 1995;8:137–45.
231. Petri M, Kim MY, Kalunian KC, et al. Combined oral contraceptives in women with systemic lupus erythematosus. N Engl J Med 2005;353:2550–8.
232. Petri M. Lupus in Baltimore: evidence-based 'clinical perarls' from the Hopkins Lupus Cohort. Lupus 2005;14:970–3.
233. Sanchez-Guerrero J, Uribe AG, Jimenez-Santana L, et al. A trial of contraceptive methods in women with systemic lupus erythematosus. N Engl J Med 2005;353:2539–49.
234. Sarabi ZS, Chang E, Bobba R, et al. Incidence rates of arterial and venous thrombosis after diagnosis of systemic lupus erythematosus. Arthritis Rheum 2005;53:609–12.
235. Schaedel ZE, Dolan G, Powell MC. The use of the levonorgestrel-releasing intrauterine system in the management of menorrhagia in women with hemostatic disorders. Am J Obstet Gynecol 2005;193:1361–3.
236. Somers E, Magder LS, Petri M. Antiphospholipid antibodies and incidence of venous thrombosis in a cohort of patients with systemic lupus erythematosus. J Rheumatol 2002;29:2531–6.

237. Urowitz MB, Bookman AA, Koehler BE, et al. The bimodal mortality pattern of systemic lupus erythematosus. Am J Med 1976;60:221–5.
238. Choojitarom K, Verasertniyom O, Totemchokchyakarn K, et al. Lupus nephritis and Raynaud's phenomenon are significant risk factors for vascular thrombosis in SLE patients with positive antiphospholipid antibodies. Clin Rheumatol 2008;27:345–51.
239. Wahl DG, Guillemin F, de Maistre E, et al. Risk for venous thrombosis related to antiphospholipid antibodies in systemic lupus erythematosus—a meta-analysis. Lupus 1997;6:467–73.
240. Demers R, Blais JA, Pretty H. Rheumatoid arthritis treated by norethynodrel associated with mestranol: clinical aspects and laboratory tests [in French]. Can Med Assoc J 1966;95:350–4.
241. Drossaers-Bakker KW, Zwinderman AH, Van ZD, Breedveld FC, Hazes JM. Pregnancy and oral contraceptive use do not significantly influence outcome in long term rheumatoid arthritis. Ann Rheum Dis 2002;61:405-8.
242. Gilbert M, Rotstein J, Cunningham C, et al. Norethynodrel with mestranol in treatment of rheumatoid arthritis. JAMA 1964;190:235.
243. Gill D. Rheumatic complaints of women using anti-ovulatory drugs. An evaluation. J Chronic Dis 1968;21:435–44.
244. Hazes JM, Dijkmans BA, Vandenbroucke JP, Cats A. Oral contraceptive treatment for rheumatoid arthritis: an open study in 10 female patients. Br J Rheumatol 1989;28 Suppl 1:28–30.
245. Ostensen M, Aune B, Husby G. Effect of pregnancy and hormonal changes on the activity of rheumatoid arthritis. Scand J Rheumatol 1983;12:69–72.
246. Vignos PJ, Dorfman RI. Effect of large doses of progesterone in rheumatoid arthritis. Am J Med Sci 1951;222:29–34.
247. Bijlsma JW, Huber-Bruning O, Thijssen JH. Effect of oestrogen treatment on clinical and laboratory manifestations of rheumatoid arthritis. Ann Rheum Dis 1987;46:777–9.
248. Carolei A, Marini C, De Matteis G. History of migraine and risk of cerebral ischaemia in young adults. The Italian National Research Council Study Group on Stroke in the Young. Lancet 1996;347:1503–6.
249. Chang CL, Donaghy M, Poulter N. Migraine and stroke in young women: case-control study. The World Health Organisation Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. BMJ 1999;318:13–8.
250. Tzourio C, Tehindrazanarivelo A, Iglesias S, et al. Case-control study of migraine and risk of ischaemic stroke in young women. BMJ 1995;310:830–3.
251. Oral contraceptives and stroke in young women. Associated risk factors. JAMA 1975;231:718–22.
252. Etminan M, Takkouche B, Isorna FC, Samii A. Risk of ischaemic stroke in people with migraine: systematic review and meta-analysis of observational studies. BMJ 2005;330:63.
253. Lidegaard O. Oral contraceptives, pregnancy, and the risk of cerebral thromboembolism: the influence of diabetes, hypertension, migraine and previous thrombotic disease [letter]. Br J Obstet Gynaecol 1996;103:94.
254. Nightingale AL, Farmer RD. Ischemic stroke in young women: a nested case-control study using the UK General Practice Research Database. Stroke 2004;35:1574–8.
255. Cromer BA, Smith RD, Blair JM, Dwyer J, Brown RT. A prospective study of adolescents who choose among levonorgestrel implant (Norplant), medroxyprogesterone acetate (Depo-Provera), or the combined oral contraceptive pill as contraception. Pediatrics 1994;94:687–94.
256. Deijen JB, Duyn KJ, Jansen WA, Klitsie JW. Use of a monophasic, low-dose oral contraceptive in relation to mental functioning. Contraception 1992;46:359–67.
257. Duke JM, Sibbritt DW, Young AF. Is there an association between the use of oral contraception and depressive symptoms in young Australian women? Contraception 2007;75:27–31.
258. Gupta N, O'Brien R, Jacobsen LJ, et al. Mood changes in adolescents using depo-medroxyprogesterone acetate for contraception: a prospective study. Am J Obstet Gynecol 2001;14:71–6.
259. Herzberg BN, Draper KC, Johnson AL, Nicol GC. Oral contraceptives, depression, and libido. BMJ 1971;3:495–500.
260. Koke SC, Brown EB, Miner CM. Safety and efficacy of fluoxetine in patients who receive oral contraceptive therapy. Am J Obstet Gynecol 2002;187:551–5.
261. O'Connell K, Davis AR, Kerns J. Oral contraceptives: side effects and depression in adolescent girls. Contraception 2007;75:299–304.
262. Westoff C, Truman C. Depressive symptoms and Depo-Provera. Contraception 1998;57:237–40.
263. Westoff C, Truman C, Kalmuss D, et al. Depressive symptoms and Norplant contraceptive implants. Contraception 1998;57:241–5.
264. Young EA, Kornstein SG, Harvey AT, et al. Influences of hormone-based contraception on depressive symptoms in premenopausal women with major depression. Psychoneuroendocrinology 2007;32:843–53.
265. Iyer V, Farquhar C, Jepson R. Oral contraceptive pills for heavy menstrual bleeding [review]. Cochrane Database Syst Rev 2000;CD000154.
266. Davis L, Kennedy SS, Moore J, Prentice A. Modern combined oral contraceptives for pain associated with endometriosis. Cochrane Database Syst Rev 2007;CD001019.
267. Hendrix SL, Alexander NJ. Primary dysmenorrhea treatment with a desogetrel-containing low-dose oral contraceptive. Contraception 2002;66:393–9.
268. Proctor ML, Roberts H, Farquhar C. Combined oral contraceptive pill (OCP) as treatment for primary dysmenorrhoea. Cochrane Database Syste Rev 2001;CD002120.
269. Adewole IF, Oladokun A, Fawole AO, Olawuyi JF, Adeleye JA. Fertility regulatory methods and development of complications after evacuation of complete hydatidiform mole. J Obstet Gynecol 2000;20:68–9.
270. Berkowitz RS, Goldstein DP, Marean AR, Bernstein M. Oral contraceptives and post-molar trophoblastic disease. Obstet Gynecol 1981;58:474–7.
271. Curry SL, Schlaerth JB, Kohorn EI, et al. Hormonal contraception and trophoblastic sequelae after hydatidiform mole (a Gynecologic Oncology Group Study). Am J Obstet Gynecol 1989;160:805–9.
272. Deicas RE, Miller DS, Rademaker AW, Lurain JR. The role of contraception in the development of postmolar trophoblastic tumour. Obstet Gynecol 1991;78:221–6.
273. Goldberg GL, Cloete K, Bloch B, Wiswedel K, Altaras MM. Medroxyprogesterone acetate in non-metastatic gestational trophoblastic disease. Br J Obstet Gynaecol 1987;94:22–5.
274. Ho Yuen B, Burch P. Relationship of oral contraceptives and the intrauterine contraceptive devices to the regression of concentration of the beta subunit of human chorionic gonadotropin and invasive complications after molar pregnancy. Am J Obstet Gynecol 1983;145:214–7.
275. Morrow P, Nakamura R, Schlaerth J, Gaddis O, Eddy G. The influence of oral contraceptives on the postmolar human chorionic gonadotropin regression curve. Am J Obstet Gynecol 1985;151:906–14.
276. Eddy GL, Schlaerth JB, Natlick RH, et al. Postmolar trophoblastic disease in women using hormonal contraception with and without estrogen. Obstet Gynecol 1983;62:736–40.

277. Smith JS. Cervical cancer and use of hormonal conraceptives: a systematic review. Lancet 2003;361:1159–67.
278. Black MM, Barclay THC, Polednak A, et al. Family history, oral contraceptive useage, and breast cancer. Cancer 1983;51:2147–51.
279. Brinton LA, Hoover R, Szklo M, Fraumeni JF. Oral contraceptives and breast cancer. Int J Epidemiol 1982;11:316–22.
280. Brohet RM, Goldgar DE, Easton DF, et al. Oral contraceptives and breast cancer risk in the International BRCA1/2 Carrier Cohort Study: a report from EMBRACE, GENEPSO, GEO-HEBON, and the IBCCS Collaborating Group. J Clin Oncol 2007;25 :3831–6.
281. Claus EB, Stowe M, Carter D. Oral contraceptives and the risk of ductal breast carcinoma in situ. Breast Cancer Res Treat 2003;81:129–36.
282. Collaborative Group on Hormonal Factors in Breast Cancer. Familial breast cancer: collaborative reanalysis of individual data from 52 epidemiological studies including 58 209 women with breast cancer and 101 986 women without the disease. Lancet 2001;358:1389–99.
283. Grabrick DM, Hartmann LC, Cerhan JR, et al. Risk of breast cancer with oral contraceptive use in women with a family history of breast cancer [comment]. JAMA 2000;284:1791–8.
284. Gronwald J, Byrski T, Huzarski T, et al. Influence of selected lifestyle factors on breast and ovarian cancer risk in *BRCA1* mutation carriers from Poland. Breast Cancer Res Treat 2006;95:105–9.
285. Haile RW, Thomas DC, McGuire V, et al. *BRCA1* and *BRCA2* mutation carriers, oral contraceptive use, and breast cancer before age 50. Cancer Epidemiol Biomarkers Prev 2006;15:1863–70.
286. Harris NV, Weiss NS, Francis AM, Polissar L. Breast cancer in relation to patterns of oral contraceptive use. Am J Epidemiol 1982;116:643–51.
287. Hennekens CH, Speizer FE, Lipnick RJ, et al. A case-control study of oral contraceptive use and breast cancer. J Natl Cancer Inst 1984;72:39–42.
288. Jernstrom H, Loman N, Johannsson OT, Borg A, Olsson H. Impact of teenage oral contraceptive use in a population-based series of early-onset breast cancer cases who have undergone *BRCA* mutation testing. Eur J Cancer 2005;41:2312–20.
289. Marchbanks PA, McDonald JA, Wilson HG, et al. Oral contraceptives and the risk of breast cancer. N Engl J Med 2002;346:2025–32.
290. Milne RL, Knight JA, John EM, et al. Oral contraceptive use and risk of early-onset breast cancer in carriers and noncarriers of *BRCA1* and *BRCA2* mutations. Cancer Epidemiol Biomarkers Prev 2005;14 :350–6.
291. Narod S, Dube MP, Klijn J, et al. Oral contraceptives and the risk of breast cancer in *BRCA1* and *BRCA2* mutation carriers. J Natl Cancer Inst 2002;94:1773–9.
292. Rosenberg L, Palmer JR, Rao RS, et al. Case-control study of oral contraceptive use and risk of breast cancer. Am J Epidemiol 1996;143:25–37.
293. Silvera SAN, Miller AB, Rohan TE. Oral contraceptive use and risk of breast cancer among women with a family history of breast cancer: a prospective cohort study. Cancer Causes Control 2005;16:1059–63.
294. Ursin G, Henderson BE, Haile RW, et al. Does oral contraceptive use increase the risk of breast cancer in women with *BRCA1/BRCA2* mutations more than in other women? Cancer Res 1997;57:3678–81.
295. Ursin G, Ross RK, Sullivan-Halley J, et al. Use of oral contraceptives and risk of breast cancer in young women. Breast Cancer Res Treat 1998;50:175–84.
296. Determinants of cervical *Chlamydia trachomatis* infection in Italy. The Italian MEGIC Group. Genitourin Med 1993;69:123–5.
297. Ackers JP, Lumsden WH, Catterall RD, Coyle R. Antitrichomonal antibody in the vaginal secretions of women infected with *T. vaginalis*. Br J Vener Dis 1975;51:319–23.
298. Acosta-Cazares B, Ruiz-Maya L, Escobedo dlP. Prevalence and risk factors for *Chlamydia trachomatis* infection in low-income rural and suburban populations of Mexico. Sex Transm Dis 1996;23:283–8.
299. Addiss DG, Vaughn ML, Holzhueter MA, Bakken LL, Davis JP. Selective screening for *Chlamydia trachomatis* infection in non-urban family planning clinics in Wisconsin. Fam Plann Perspect 1987;19:252–6.
300. Arya OP, Mallinson H, Goddard AD. Epidemiological and clinical correlates of chlamydial infection of the cervix. Br J Vener Dis 1981;57:118–24.
301. Austin H, Louv WC, Alexander WJ. A case-control study of spermicides and gonorrhea. JAMA 1984;251:2822–4.
302. Avonts D, Sercu M, Heyerick P, et al. Incidence of uncomplicated genital infections in women using oral contraception or an intrauterine device: a prospective study. Sex Transm Dis 1990;17:23–9.
303. Baeten JM, Nyange PM, Richardson BA, et al. Hormonal contraception and risk of sexually transmitted disease acquisition: results from a prospective study. Am J Obstet Gynecol 2001;185:380–5.
304. Barbone F, Austin H, Louv WC, Alexander WJ. A follow-up study of methods of contraception, sexual activity, and rates of trichomoniasis, candidiasis, and bacterial vaginosis. Am J Obstet Gynecol 1990;163:510–4.
305. Barnes RC, Katz BP, Rolfs RT, et al. Quantitative culture of endocervical *Chlamydia trachomatis*. J Clin Microbiol 1990;28:774–80.
306. Berger GS, Keith L, Moss W. Prevalence of gonorrhoea among women using various methods of contraception. Br J Vener Dis 1975;51:307–9.
307. Bhattacharyya MN, Jephcott AE. Diagnosis of gonorrhea in women—influence of the contraceptive pill. J Am Vener Dis Assoc 1976;2:21–4.
308. Blum M, Pery J, Kitai E. The link between contraceptive methods and *Chlamydia trachomatis* infection. Adv Contracept 1988;4:233–9.
309. Bontis J, Vavilis D, Panidis D, et al. Detection of *Chlamydia trachomatis* in asymptomatic women: relationship to history, contraception, and cervicitis. Adv Contracept 1994;10:309–15.
310. Bramley M, Kinghorn G. Do oral contraceptives inhibit *Trichomonas vaginalis*? Sex Transm Dis 1979;6:261–3.
311. Bro F, Juul S. Predictors of *Chlamydia trachomatis* infection in women in general practice. Fam Pract 1990;7:138–43.
312. Burns DC, Darougar S, Thin RN, Lothian L, Nicol CS. Isolation of *Chlamydia* from women attending a clinic for sexually transmitted disease. Br J Vener Dis 1975;51:314–8.
313. Ceruti M, Canestrelli M, Condemi V, et al. Methods of contraception and rates of genital infections. Clin Exp Obstet Gynecol 1994;21:119–23.
314. Chacko M, Lovchik J. *Chlamydia trachomatis* infection in sexually active adolescents: prevalence and risk factors. Pediatrics 1984;73:836–40.
315. Cottingham J, Hunter D. *Chlamydia trachomatis* and oral contraceptive use: a quantitative review. Genitourin Med 1992;68:209–16.
316. Crowley T, Horner P, Hughes A, et al. Hormonal factors and the laboratory detection of *Chlamydia trachomatis* in women: implications for screening? Int J STD AIDS 1997;8:25–31.
317. Edwards D, Phillips D, Stancombe S. *Chlamydia trachomatis* infection at a family planning clinic. N Z Med J 1985;98:333–5.
318. Evans BA, Kell PD, Bond RA, et al. Predictors of seropositivity to herpes simplex virus type 2 in women. Int J STD AIDS 2003;14:30–6.

319. Evans DL, Demetriou E, Shalaby H, Waner JL. Detection of *Chlamydia trachomatis* in adolescent females using direct immunofluorescence. Clin Pediatr (Phila) 1988;27:223–8.
320. Fish AN, Fairweather DV, Oriel JD, Ridgway GL. *Chlamydia trachomatis* infection in a gynaecology clinic population: identification of high-risk groups and the value of contact tracing. Eur J Obstet Gynecol Reprod Biol 1989;31:67–74.
321. Fouts AC, Kraus SJ. *Trichomonas vaginalis*: reevaluation of its clinical presentation and laboratory diagnosis. J Infect Dis 1980;141:137–43.
322. Fraser JJ, Jr., Rettig PJ, Kaplan DW. Prevalence of cervical *Chlamydia trachomatis* and *Neisseria gonorrhoeae* in female adolescents. Pediatrics 1983;71:333–6.
323. Gertig DM, Kapiga SH, Shao JF, Hunter DJ. Risk factors for sexually transmitted diseases among women attending family planning clinics in Dar-es-Salaam, Tanzania. Genitourin Med 1997;73:39–43.
324. Green J, de Gonzalez AB, Smith JS, et al. Human papillomavirus infection and use of oral contraceptives. Br J Cancer 2003;88:1713–20.
325. Griffiths M, Hindley D. Gonococcal pelvic inflammatory disease, oral contraceptives, and cervical mucus. Genitourin Med 1985;61:67.
326. Han Y, Morse DL, Lawrence CE, Murphy D, Hipp S. Risk profile for *Chlamydia* infection in women from public health clinics in New York State. J Community Health 1993;18:1–9.
327. Handsfield HH, Jasman LL, Roberts PL, et al. Criteria for selective screening for *Chlamydia trachomatis* infection in women attending family planning clinics. JAMA 1986;255:1730–4.
328. Hanna NF, Taylor-Robinson D, Kalodiki-Karamanoli M, Harris JR, McFadyen IR. The relation between vaginal pH and the microbiological status in vaginitis. Br J Obstet Gynaecol 1985;92:1267–71.
329. Harrison HR, Costin M, Meder JB, et al. Cervical *Chlamydia trachomatis* infection in university women: relationship to history, contraception, ectopy, and cervicitis. Am J Obstet Gynecol 1985;153:244–51.
330. Hart G. Factors associated with genital chlamydial and gonococcal infection in females. Genitourin Med 1992;68:217–20.
331. Herrmann B, Espinoza F, Villegas RR, et al. Genital chlamydial infection among women in Nicaragua: validity of direct fluorescent antibody testing, prevalence, risk factors and clinical manifestations. Genitourin Med 1996;72:20–6.
332. Hewitt AB. Oral contraception among special clinic patients. With particular reference to the diagnosis of gonorrhoea. Br J Vener Dis 1970;46:106–7.
333. Hilton AL, Richmond SJ, Milne JD, Hindley F, Clarke SK. *Chlamydia* A in the female genital tract. Br J Vener Dis 1974;50:1–10.
334. Hiltunen-Back E, Haikala O, Kautiainen H, Paavonen J, Reunala T. A nationwide sentinel clinic survey of *Chlamydia trachomatis* infection in Finland. Sex Transm Dis 2001;28:252–8.
335. Jacobson DL, Peralta L, Farmer M, et al. Relationship of hormonal contraception and cervical ectopy as measured by computerized planimetry to chlamydial infection in adolescents. Sex Transm Dis 2000;27:313–9.
336. Jaffe LR, Siqueira LM, Diamond SB, Diaz A, Spielsinger NA. *Chlamydia trachomatis* detection in adolescents. A comparison of direct specimen and tissue culture methods. J Adolesc Health Care 1986;7:401–4.
337. Jick H, Hannan MT, Stergachis A, et al. Vaginal spermicides and gonorrhea. JAMA 1982;248:1619–21.
338. Johannisson G, Karamustafa A, Brorson J. Influence of copper salts on gonococci. Br J Vener Dis 1976;52:176–7.
339. Keith L, Berer GS, Moss W. Cervical gonorrhea in women using different methods of contraception. J Am Vener Dis Assoc 1976;3:17–9.
340. Kinghorn GR, Waugh MA. Oral contraceptive use and prevalence of infection with *Chlamydia trachomatis* in women. Br J Vener Dis 1981;57:187–90.
341. Lavreys L, Chohan B, Ashley R, et al. Human herpesvirus 8: seroprevalence and correlates in prostitutes in Mombasa, Kenya. J Infect Dis 2003;187:359–63.
342. Lefevre JC, Averous S, Bauriaud R, et al. Lower genital tract infections in women: comparison of clinical and epidemiologic findings with microbiology. Sex Transm Dis 1988;15:110–3.
343. Louv WC, Austin H, Perlman J, Alexander WJ. Oral contraceptive use and the risk of chlamydial and gonococcal infections. Am J Obstet Gynecol 1989;160:396–402.
344. Lowe TL, Kraus SJ. Quantitation of *Neisseria gonorrhoeae* from women with gonorrhea. J Infect Dis 1976;133:621–6.
345. Lycke E, Lowhagen GB, Hallhagen G, Johannisson G, Ramstedt K. The risk of transmission of genital *Chlamydia trachomatis* infection is less than that of genital *Neisseria gonorrhoeae* infection. Sex Transm Dis 1980;7:6–10.
346. Macaulay ME, Riordan T, James JM, et al. A prospective study of genital infections in a family-planning clinic. 2. *Chlamydia* infection—the identification of a high-risk group. Epidemiol Infect 1990;104:55–61.
347. Magder LS, Harrison HR, Ehret JM, Anderson TS, Judson FN. Factors related to genital *Chlamydia trachomatis* and its diagnosis by culture in a sexually transmitted disease clinic. Am J Epidemiol 1988;128:298–308.
348. Magder LS, Klontz KC, Bush LH, Barnes RC. Effect of patient characteristics on performance of an enzyme immunoassay for detecting cervical *Chlamydia trachomatis* infection. J Clin Microbiol 1990;28:781–4.
349. Masse R, Laperriere H, Rousseau H, Lefebvre J, Remis RS. *Chlamydia trachomatis* cervical infection: prevalence and determinants among women presenting for routine gynecologic examination. Can Med Assoc J 1991;145:953–61.
350. McCormack WM, Reynolds GH. Effect of menstrual cycle and method of contraception on recovery of *Neisseria gonorrhoeae*. JAMA 1982;247:1292–4.
351. Morrison CS, Bright P, Wong EL, et al. Hormonal contraceptive use, cervical ectopy, and the acquisition of cervical infections. Sex Transm Dis 2004;31:561–7.
352. Nayyar KC, O'Neill JJ, Hambling MH, Waugh MA. Isolation of *Chlamydia trachomatis* from women attending a clinic for sexually transmitted diseases. Br J Vener Dis 1976;52:396–8.
353. Oh MK, Feinstein RA, Soileau EJ, Cloud GA, Pass RF. *Chlamydia trachomatis* cervical infection and oral contraceptive use among adolescent girls. J Adolesc Health Care 1989;10:376–81.
354. Oriel JD, Powis PA, Reeve P, Miller A, Nicol CS. Chlamydial infections of the cervix. Br J Vener Dis 1974;50:11–6.
355. Oriel JD, Johnson AL, Barlow D, et al. Infection of the uterine cervix with *Chlamydia trachomatis*. J Infect Dis 1978;137:443–51.
356. Paavonen J, Vesterinen E. *Chlamydia trachomatis* in cervicitis and urethritis in women. Scand J Infect Dis Suppl 1982;32:45–54.
357. Park BJ, Stergachis A, Scholes D, et al. Contraceptive methods and the risk of *Chlamydia trachomatis* infection in young women. Am J Epidemiol 1995;142:771–8.
358. Pereira LH, Embil JA, Haase DA, Manley KM. Cytomegalovirus infection among women attending a sexually transmitted disease clinic: association with clinical symptoms and other sexually transmitted diseases. Am J Epidemiol 1990;131:683–92.

359. Rahm VA, Odlind V, Pettersson R. *Chlamydia trachomatis* in sexually active teenage girls. Factors related to genital chlamydial infection: a prospective study. Genitourin Med 1991;67:317–21.
360. Reed BD, Huck W, Zazove P. Differentiation of *Gardnerella vaginalis*, *Candida albicans*, and *Trichomonas vaginalis* infections of the vagina. J Fam Pract 1989;28:673–80.
361. Ripa KT, Svensson L, Mardh PA, Westrom L. *Chlamydia trachomatis* cervicitis in gynecologic outpatients. Obstet Gynecol 1978;52:698–702.
362. Ruijs GJ, Kauer FM, van Gijssel PM, Schirm J, Schroder FP. Direct immunofluorescence for *Chlamydia trachomatis* on urogenital smears for epidemiological purposes. Eur J Obstet Gynecol Reprod Biol 1988;27:289–97.
363. Schachter J, Stoner E, Moncada J. Screening for chlamydial infections in women attending family planning clinics. West J Med 1983;138:375–9.
364. Sellors JW, Karwalajtys TL, Kaczorowski J, et al. Incidence, clearance and predictors of human papillomavirus infection in women. Can Med Assoc J 2003;168:421–5.
365. Sessa R, Latino MA, Magliano EM, et al. Epidemiology of urogenital infections caused by *Chlamydia trachomatis* and outline of characteristic features of patients at risk. J Med Microbiol 1994;41:168–72.
366. Shafer MA, Beck A, Blain B, et al. *Chlamydia trachomatis*: important relationships to race, contraception, lower genital tract infection, and Papanicolaou smear. J Pediatr 1984;104:141–6.
367. Smith JS, Herrero R, Munoz N, et al. Prevalence and risk factors for herpes simplex virus type 2 infection among middle-age women in Brazil and the Philippines. Sex Transm Dis 2001;28:187–94.
368. Staerfelt F, Gundersen TJ, Halsos AM, et al. A survey of genital infections in patients attending a clinic for sexually transmitted diseases. Scand J Infect Dis Suppl 1983;40:53–7.
369. Svensson L, Westrom L, Mardh PA. *Chlamydia trachomatis* in women attending a gynaecological outpatient clinic with lower genital tract infection. Br J Vener Dis 1981;57:259–62.
370. Tait IA, Rees E, Hobson D, Byng RE, Tweedie MC. Chlamydial infection of the cervix in contacts of men with nongonococcal urethritis. Br J Vener Dis 1980;56:37–45.
371. Vaccarella S, Herrero R, Dai M, et al. Reproductive factors, oral contraceptive use, and human papillomavirus infection: pooled analysis of the IARC HPV prevalence surveys. Cancer Epidemiol Biomarkers Prev 2006;15:2148–53.
372. Willmott FE, Mair HJ. Genital herpesvirus infection in women attending a venereal diseases clinic. Br J Vener Dis 1978;54:341–3.
373. Winer RL, Lee SK, Hughes JP, et al. Genital human papillomavirus infection: incidence and risk factors in a cohort of female university students. Am J Epidemiol 2003;157:218–26. Erratum in Am J Epidemiol. 2003;157:858.
374. Winter L, Goldy AS, Baer C. Prevalence and epidemiologic correlates of *Chlamydia trachomatis* in rural and urban populations. Sex Transm Dis 1990;17:30–6.
375. Wolinska WH, Melamed MR. Herpes genitalis in women attending Planned Parenthood of New York City. Acta Cytol 1970;14:239–42.
376. Woolfitt JM, Watt L. Chlamydial infection of the urogenital tract in promiscuous and non-promiscuous women. Br J Vener Dis 1977;53:93–5.
377. European Study Group on Heterosexual Transmission of HIV. Comparison of female to male and male to female transmission of HIV in 563 stable couples. BMJ 1992;304:809–13.
378. Aklilu M, Messele T, Tsegaye A, et al. Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia. AIDS 2001;15:87–96.
379. Allen S, Serufilira A, Gruber V, et al. Pregnancy and contraception use among urban Rwandan women after HIV testing and counseling. Am J Public Health 1993;83:705–10.
380. Baeten JM, Benki S, Chohan V, et al. Hormonal contraceptive use, herpes simplex virus infection, and risk of HIV-1 acquisition among Kenyan women. AIDS 2007;21:1771–7.
381. Chao A, Bulterys M, Musanganire F, et al. Risk factors associated with prevalent HIV-1 infection among pregnant women in Rwanda. National University of Rwanda–Johns Hopkins University AIDS Research Team. Int J Epidemiol 1994;23:371–80.
382. Cohen CR, Duerr A, Pruithithada N, et al. Bacterial vaginosis and HIV seroprevalence among female commercial sex workers in Chiang Mai, Thailand. AIDS 1995;9:1093–7.
383. Criniti A, Mwachari CW, Meier AS, et al. Association of hormonal contraception and HIV-seroprevalence in Nairobi, Kenya. AIDS 2003;17:2667–9.
384. de Vincenzi I. A longitudinal study of human immunodeficiency virus transmission by heterosexual partners. European Study Group on Heterosexual Transmission of HIV [comment]. N Engl J Med 1994;331:341–6.
385. Ellerbrock TV, Lieb S, Harrington PE, et al. Heterosexually transmitted human immunodeficiency virus infection among pregnant women in a rural Florida community [comment]. N Engl J Med 1992;327:1704–9.
386. Gray JA, Dore GJ, Li Y, et al. HIV-1 infection among female commercial sex workers in rural Thailand. AIDS 1997;11:89–94.
387. Guimaraes MD, Munoz A, Boschi-Pinto C, Castilho EA. HIV infection among female partners of seropositive men in Brazil. Rio de Janeiro Heterosexual Study Group. Am J Epidemiol 1995;142:538–47.
388. Hira SK, Kamanga J, Macuacua R, Feldblum PJ. Oral contraceptive use and HIV infection. Int J STD AIDS 1990;1:447–8.
389. Kapiga SH, Shao JF, Lwihula GK, Hunter DJ. Risk factors for HIV infection among women in Dar-es-Salaam, Tanzania. J Acquir Immune Defic Syndr 1994;7:301–9.
390. Kapiga SH, Lyamuya EF, Lwihula GK, Hunter DJ. The incidence of HIV infection among women using family planning methods in Dar es Salaam, Tanzania. AIDS 1998;12:75–84.
391. Kilmarx PH, Limpakarnjanarat K, Mastro TD, et al. HIV-1 seroconversion in a prospective study of female sex workers in northern Thailand: continued high incidence among brothel-based women. AIDS 1998;12:1889–98.
392. Kunanusont C, Foy HM, Kreiss JK, et al. HIV-1 subtypes and male-to-female transmission in Thailand. Lancet 1995;345:1078–83.
393. Laga M, Manoka A, Kivuvu M, et al. Non-ulcerative sexually transmitted diseases as risk factors for HIV-1 transmission in women: results from a cohort study [comment]. AIDS 1993;7:95–102.
394. Lavreys L, Baeten JM, Martin HL, Jr., et al. Hormonal contraception and risk of HIV-1 acquisition: results of a 10-year prospective study. AIDS 2004;18:695–7.
395. Limpakarnjanarat K, Mastro TD, Saisorn S, et al. HIV-1 and other sexually transmitted infections in a cohort of female sex workers in Chiang Rai, Thailand. Sex Transm Infect 1999;75:30–5.
396. Martin HL, Jr, Nyange PM, Richardson BA, et al. Hormonal contraception, sexually transmitted diseases, and risk of heterosexual transmission of human immunodeficiency virus type 1. J Infect Dis 1998;178:1053–9.

397. Mati JK, Hunter DJ, Maggwa BN, Tukei PM. Contraceptive use and the risk of HIV infection in Nairobi, Kenya. Int J Gynaecol Obstet 1995;48:61–7.
398. Morrison CS, Richardson BA, Mmiro F, et al. Hormonal contraception and the risk of HIV acquisition. AIDS 2007;21:85–95.
399. Moss GB, Clemetson D, D'Costa L, et al. Association of cervical ectopy with heterosexual transmission of human immunodeficiency virus: results of a study of couples in Nairobi, Kenya. J Infect Dis 1991;164:588–91.
400. Myer L, Denny L, Wright TC, Kuhn L. Prospective study of hormonal contraception and women's risk of HIV infection in South Africa. Int J Epidemiol 2007;36:166–74.
401. Nagachinta T, Duerr A, Suriyanon V, et al. Risk factors for HIV-1 transmission from HIV-seropositive male blood donors to their regular female partners in northern Thailand. AIDS 1997;11:1765–72.
402. Nicolosi A, Correa Leite ML, Musicco M, et al. The efficiency of male-to-female and female-to-male sexual transmission of the human immunodeficiency virus: a study of 730 stable couples. Italian Study Group on HIV Heterosexual Transmission [comment]. Epidemiology 1994;5:570–5.
403. Nzila N, Laga M, Thiam MA, et al. HIV and other sexually transmitted diseases among female prostitutes in Kinshasa. AIDS 1991;5:715–21.
404. Pineda JA, Aguado I, Rivero A, et al. HIV-1 infection among non-intravenous drug user female prostitutes in Spain. No evidence of evolution to pattern II. AIDS 1992;6:1365–9.
405. Plourde PJ, Plummer FA, Pepin J, et al. Human immunodeficiency virus type 1 infection in women attending a sexually transmitted diseases clinic in Kenya [comment]. J Infect Dis 1992;166:86–92.
406. Plummer FA, Simonsen JN, Cameron DW, et al. Cofactors in male-female sexual transmission of human immunodeficiency virus type 1 [comment]. J Infect Dis 1991;163:233–9.
407. Rehle T, Brinkmann UK, Siraprapasiri T, et al. Risk factors of HIV-1 infection among female prostitutes in Khon Kaen, northeast Thailand. Infection 1992;20:328–31.
408. Saracco A, Musicco M, Nicolosi A, et al. Man-to-woman sexual transmission of HIV: longitudinal study of 343 steady partners of infected men. J Acquir Immune Defic Syndr 1993;6:497–502.
409. Simonsen JN, Plummer FA, Ngugi EN, et al. HIV infection among lower socioeconomic strata prostitutes in Nairobi. AIDS 1990;4:139–44.
410. Sinei SK, Fortney JA, Kigondu CS, et al. Contraceptive use and HIV infection in Kenyan family planning clinic attenders. Int J STD AIDS 1996;7:65–70.
411. Siraprapasiri T, Thanprasertsuk S, Rodklay A, et al. Risk factors for HIV among prostitutes in Chiangmai, Thailand. AIDS 1991;5:579–82.
412. Spence MR, Robbins SM, Polansky M, Schable CA. Seroprevalence of human immunodeficiency virus type I (HIV-1) antibodies in a family-planning population. Sex Transm Dis 1991;18:143–5.
413. Taneepanichskul S, Phuapradit W, Chaturachinda K. Association of contraceptives and HIV-1 infection in Thai female commercial sex workers. Aust N Z J Obstet Gynaecol 1997;37:86–8.
414. Temmerman M, Chomba EN, Ndinya-Achola J, et al. Maternal human immunodeficiency virus-1 infection and pregnancy outcome. Obstet Gynecol 1994;83:495–501.
415. Ungchusak K, Rehle T, Thammapornpilap P, et al. Determinants of HIV infection among female commercial sex workers in northeastern Thailand: results from a longitudinal study. J Acquir Immune Defic Syndr Hum Retrovirol 1996;12:500–7. Eerratum in J Acquir Immune Defic Syndr Hum Retrovirol 1998;18:192.
416. Allen S, Stephenson R, Weiss H, et al. Pregnancy, hormonal contraceptive use, and HIV-related death in Rwanda. J Womens Health (Larchmt) 2007;16:1017–27.
417. Cejtin HE, Jacobson L, Springer G, et al. Effect of hormonal contraceptive use on plasma HIV-1-RNA levels among HIV-infected women. AIDS 2003;17:1702–4.
418. Clark RA, Kissinger P, Williams T. Contraceptive and sexually transmitted diseases protection among adult and adolescent women infected with human immunodeficiency virus. Int J STD AIDS 1996;7:439–42.
419. Clark RA, Theall KP, Amedee AM, et al. Lack of association between genital tract HIV-1 RNA shedding and hormonal contraceptive use in a cohort of Louisiana women. Sex Transm Dis 2007;34:870–2.
420. Clemetson DB, Moss GB, Willerford DM, et al. Detection of HIV DNA in cervical and vaginal secretions. Prevalence and correlates among women in Nairobi, Kenya. JAMA 1993;269:2860–4.
421. Kaul R, Kimani J, Nagelkerke NJ, et al. Risk factors for genital ulcerations in Kenyan sex workers. The role of human immunodeficiency virus type 1 infection. Sex Transm Dis 1997;24:387–92.
422. Kilmarx PH, Limpakarnjanarat K, Kaewkungwal J, et al. Disease progression and survival with human immunodeficiency virus type 1 subtype E infection among female sex workers in Thailand. J Infect Dis 2000;181:1598–606.
423. Kovacs A, Wasserman SS, Burns D, et al. Determinants of HIV-1 shedding in the genital tract of women. Lancet 2001;358:1593–601.
424. Kreiss J, Willerford DM, Hensel M, et al. Association between cervical inflammation and cervical shedding of human immunodeficiency virus DNA. J Infect Dis 1994;170:1597–601.
425. Lavreys L, Chohan V, Overbaugh J, et al. Hormonal contraception and risk of cervical infections among HIV-1-seropositive Kenyan women. AIDS 2004;18:2179–84.
426. Mostad SB, Overbaugh J, DeVange DM, et al. Hormonal contraception, vitamin A deficiency, and other risk factors for shedding of HIV-1 infected cells from the cervix and vagina. Lancet 1997;350:922–7.
427. Richardson BA, Otieno PA, Mbori-Ngacha D, et al. Hormonal contraception and HIV-1 disease progression among postpartum Kenyan women. AIDS 2007;21:749–53.
428. Seck K, Samb N, Tempesta S, et al. Prevalence and risk factors of cervicovaginal HIV shedding among HIV-1 and HIV-2 infected women in Dakar, Senegal. Sex Transm Infect 2001;77:190–3.
429. Stringer EM, Kaseba C, Levy J, et al. A randomized trial of the intrauterine contraceptive device vs hormonal contraception in women who are infected with the human immunodeficiency virus. Am J Obstet Gynecol 2007;197:144–8.
430. Taneepanichskul S, Intaraprasert S, Phuapradit W, Chaturachinda K. Use of Norplant implants in asymptomatic HIV-1 infected women. Contraception 1997;55:205–7.
431. Taneepanichskul S, Tanprasertkul C. Use of Norplant implants in the immediate postpartum period among asymptomatic HIV-1-positive mothers. Contraception 2001;64:39–41.
432. Wang CC, McClelland RS, Overbaugh J, et al. The effect of hormonal contraception on genital tract shedding of HIV-1. AIDS 2004;18:205–9.

433. el-Raghy L, Black DJ, Osman F, Orme ML, Fathalla M. Contraceptive steroid concentrations in women with early active schistosomiasis: lack of effect of antischistosomal drugs. Contraception 1986;33:373–7.
434. Gad-el-Mawla N, Abdallah A. Liver function in bilharzial females receiving contraceptive pills. Acta Hepato 1969;16:308–10.
435. Gad-el-Mawla N, el-Roubi O, Sabet S, Abdallah A. Plasma lipids and lipoproteins in bilharzial females during oral contraceptive therapy. J Egypt Med Assoc 1972;55:137–47.
436. Shaaban MM, Hammad WA, Falthalla MF, et al. Effects of oral contraception on liver function tests and serum proteins in women with active schistosomiasis. Contraception 1982;26:75–82.
437. Shaaban MM, Ghaneimah SA, Mohamed MA, Abdel-Chani S, Mostafa SA. Effective of oral contraception on serum bile acid. Int J Gynaecol Obstet 1984;22:111–5.
438. Sy FS, Osteria TS, Opiniano V, Gler S. Effect of oral contraceptive on liver function tests of women with schistosomiasis in the Philippines. Contraception 1986;34:283–94.
439. Tagy AH, Saker ME, Moussa AA, Kolgah A. The effect of low-dose combined oral contraceptive pills versus injectable contracetpive (Depot Provera) on liver function tests of women with compensated bilharzial liver fibrosis. Contraception 2001;64:173–6.
440. Beck P, Wells SA. Comparison of the mechanisms underlying carbohydrate intolerance in subclinical diabetic women during pregnancy and during post-partum oral contraceptive steroid treatment. J Clin Endocrinol Metab 1969;29:807–18.
441. Kjos SL, Peters RK, Xiang A, et al. Contraception and the risk of type 2 diabetes mellitus in Latina women with prior gestational diabetes mellitus. JAMA 1998;280:533–8.
442. Kung AW, Ma JT, Wong VC, et al. Glucose and lipid metabolism with triphasic oral contraceptives in women with history of gestational diabetes. Contraception 1987;35:257–69.
443. Radberg T, Gustafson A, Skryten A, Karlsson K. Metabolic studies in gestational diabetic women during contraceptive treatment: effects on glucose tolerance and fatty acid composition of serum lipids. Gynecol Obstet Invest 1982;13:17–29.
444. Skouby SO, Molsted-Pedersen L, Kuhl C. Low dosage oral contraception in women with previous gestational diabetes. Obstet Gynecol 1982;59:325–8.
445. Skouby SO, Andersen O, Kuhl C. Oral contraceptives and insulin receptor binding in normal women and those with previous gestational diabetes. Am J Obstet Gynecol 1986;155:802–7.
446. Skouby SO, Andersen O, Saurbrey N, Kuhl C. Oral contraception and insulin sensitivity: in vivo assessment in normal women and women with previous gestational diabetes. J Clin Endocrinol Metab 1987;64:519–23.
447. Xiang AH, Kawakubo M, Kjos SL, Buchanan TA. Long-acting injectable progestin contraception and risk of type 2 diabetes in Latino women with prior gestational diabetes mellitus. Diabetes Care 2006;29:613–7.
448. Kjos SL, Shoupe D, Douyan S, et al. Effect of low-dose oral contraceptives on carbohydrate and lipid metabolism in women with recent gestational diabetes: results of a controlled, randomized, prospective study. Am J Obstet Gynecol 1990;163:1822–7.
449. Radberg T, Gustafson A, Skryten A, Karlsson K. Metabolic studies in women with previous gestational diabetes during contraceptive treatment: effects on serum lipids and high density lipoproteins. Acta Endocrinol (Copenh) 1982;101:134–9.
450. Skouby SO, Kuhl C, Molsted-Pedersen L, Petersen K, Christensen MS. Triphasic oral contraception: metabolic effects in normal women and those with previous gestational diabetes. Am J Obstet Gynecol 1985;153:495–500.
451. Beck P, Arnett DM, Alsever RN, Eaton RP. Effect of contraceptive steroids on arginine-stimulated glucagon and insulin secretion in women. ll. Carbohydrate and lipid phsiology in insulin-dependent diabetics. Metabolism 1976;25:23–31.
452. Diab KM, Zaki MM. Contraception in diabetic women: comparative metabolic study of norplant, depot medroxyprogesterone acetate, low dose oral contraceptive pill and CuT380A. J Obstet Gynecol Res 2000;26:17–26.
453. Garg SK, Chase P, Marshall G, et al. Oral contraceptives and renal and retinal complications in young women with insulin-dependent diabetes mellitus. JAMA 1994;271:1099–102.
454. Grigoryan OR, Grodnitskaya EE, Andreeva EN, et al. Contraception in perimenopausal women with diabetes mellitus. Gynecol Endocrinol 2006;22:198–206.
455. Margolis KL, Adami H-O, Luo J, Ye W, Weiderpass E. A prospective study of oral contraceptive use and risk of myocardial infarction among Swedish women. Fertil Steril 2007;88:310–6.
456. Petersen KR, Skouby SO, Sidelmann J, Jespersen J. Assessment of endothelial function during oral contraception on women with insulin-dependent diabetes mellitus. Metabolism 1994;43:1379–83.
457. Petersen KR, Skouby SO, Jespersen J. Balance of coagulation activity with fibrinolysis during use of oral contraceptives in women with insulin-dependent diabetes millitus. Int J Fertil 1995;40:105–11.
458. Radberg T, Gustafson A, Skryten A, Karlsson k. Oral contraception in diabetic women. A cross-over study on seum and high density lipoprotein (HDL) lipids and diabetes control during progestogen and combined estrogen/progestogen contraception. Horm Metab Res 1982;14:61–5.
459. Skouby SO, Jensen BM, Kuhl C, et al. Hormonal contraception in diabetic women: acceptability and influence on diabetes control and ovarian function of a nonalkylated estrogen/progestogen compound. Contraception 1985;32:23–31.
460. Skouby SO, Molsted-Petersen L, Kuhl C, Bennet P. Oral contraceptives in diabetic womne: metabolic effects of four compounds with different estrogen/progestogen profiles. Fertil Steril 1986;46:858–64.
461. Bitton A, Peppercorn MA, Antonioli DA, et al. Clinical, biological, and histologic parameters as predictors of relapse in ulcerative colitis. Gastroenterology 2001;120:13–20.
462. Cosnes J, Carbonnel F, Carrat F, Beaugerie L, Gendre JP. Oral contraceptive use and the clinical course of Crohn's disease: a prospective cohort study. Gut 1999;45:218–22.
463. Sutherland LR, Ramcharan S, Bryant H, Fick G. Effect of oral contraceptive use on reoperation following surgery for Crohn's disease. Dig Dis Sci 1992;37:1377–82.
464. Timmer A, Sutherland LR, Martin F. Oral contraceptive use and smoking are risk factors for relapse in Crohn's disease. The Canadian Mesalamine for Remission of Crohn's Disease Study Group. Gastroenterology 1998;114:1143–50.
465. Wright JP. Factors influencing first relapse in patients with Crohn's disease. J Clin Gastroenterol 1992;15:12–6.
466. Grimmer SF, Back DJ, Orme ML, et al. The bioavailability of ethinyloestradiol and levonorgestrel in patients with an ileostomy. Contraception 1986;33:51–9.

467. Nilsson LO, Victor A, Kral JG, Johansson ED, Kock NG. Absorption of an oral contraceptive gestagen in ulcerative colitis before and after proctocolectomy and construction of a continent ileostomy. Contraception 1985;31:195–204.
468. Bernstein CN, Blanchard JF, Houston DS, Wajda A. The incidence of deep venous thrombosis and pulmonary embolism among patients with inflammatory bowel disease: a population-based cohort study. Thromb Haemost 2001;85:430–4.
469. Di Martino V, Lebray P, Myers RP, et al. Progression of liver fibrosis in women infected with hepatitis C: long-term benefit of estrogen exposure. Hepatology 2004;40:1426–33.
470. Libbrecht L, Craninx M, Nevens F, Desmet V, Roskams T. Predictive value of liver cell dysplasia for development of hepatocellular carcinoma in patients with non-cirrhotic and cirrhotic chronic viral hepatitis. Histopathology 2001;39:66–73.
471. Eisalo A, Konttinen A, Hietala O. Oral contraceptives after liver disease. Br Med J 1971;3:561–2.
472. Peishan Wang, Zemin Lai, Jinlan Tang, et al. Safety of hormonal steroid contraceptive use for hepatitis B virus carrier women. Pharmacoepidemiol Drug Saf 2000;9:245–6.
473. Shaaban MM, Hammad WA, Fathalla MF, et al. Effects of oral contraception on liver function tests and serum proteins in women with past viral hepatitis. Contraception 1982;26:65–74.
474. Schweitzer IL, Weiner JM, McPeak CM, Thursby MW. Oral contraceptives in acute viral hepatitis. JAMA 1975;233:979–80.
475. D'halluin V, Vilgrain V, Pelletier G, et al. Natural history of focal nodular hyperplasia. A retrospective study of 44 cases [in French]. Gastroenterol Clin Biol 2001;25:1008–10.
476. Mathieu D, Kobeiter H, Maison P, et al. Oral contraceptive use and focal nodular hyperplasia of the liver. Gastroenterology 2000;118:560–4.
477. Pietrzak B, Bobrowska K, Jabiry-Zieniewicz Z, et al. Oral and transdermal hormonal contraception in women after kidney transplantation. Transplant Proc 2007;39:2759–62.
478. Pietrzak B, Kaminski P, Wielgos M, Bobrowska K, Durlik M. Combined oral contraception in women after renal transplantation. Neuro Endocrinol Lett 2 006;27:679–82.
479. Jabiry-Zieniewicz Z, Bobrowska K, Kaminski P, et al. Low-dose hormonal contraception after liver transplantation. Transplant Proc 2007;39:1530–2.
480. Fedorkow DM, Corenblum B, Shaffer EA. Cholestasis induced by oestrogen after liver transplantation. BMJ 1989;299:1080–1.
481. Back DJ, Bates M, Bowden A, et al. The interaction of phenobarbital and other anticonvulsants with oral contraceptive steroid therapy. Contraception 1980;22:495–503.
482. Doose DR, Wang S, Padmanabhan M, et al. Effects of topiramate or carbamazepine on the pharmacokinetics of an oral contraceptive containing norethindrone and ethinyl estradiol in healthy obese and nonobese female subjects. Epilepsia 2003;44:540–9.
483. Fattore C, Cipolla G, Gatti G, et al. Induction of ethinylestradiol and levonorgestrel metabolism by oxcarbazepine in healthy women. Epilepsia 1999;40:783–7.
484. Rosenfeld WE, Doose DR, Walker SA, Nayak RK. Effect of topiramate on the pharmacokinetics of an oral contraceptive containing norethindrone and ethinyl estradiol in patients with epilepsy. Epilepsia 1997;38:317–23.
485. Christensen J, Petrenaite V, Atterman J, et al. Oral contraceptives induce lamotrigine metabolism: evidence from a double-blind, placebo-controlled trial. Epilepsia 2007;48:484–9.
486. Contin M, Albani F, Ambrosetto G, et al. Variation in lamotrigine plasma concentrations with hormonal contraceptive monthly cycles in partiens with epilepsy. Epilepsia 2006;47:1573–5.
487. Reimers A, Helde G, Brodtkorb E. Ethinyl estradiol, not progestogens, reduces lamotrigine serum concentrations. Epilepsia 2005;46:1414–7.
488. Sabers A, Buchholt JM, Uldall P, Hansen EL. Lamotrigine plasma levels reduced by oral contraceptives. Epilepsy Res 2001;47:151–4.
489. Sabers A, Ohman I, Christensen J, Tomson T. Oral contraceptives reduce lamotrigine plasma levels. Neurology 2003;61:570–1.
490. Back DJ, Breckenridge AM, MacIver M, et al. The effects of ampicillin on oral contraceptive steroids in women. Br J Clin Pharmacol 1982;14:43–8.
491. Back DJ, Grimmer SF, Orme ML, et al. Evaluation of the Committee on Safety of Medicines yellow card reports on oral contraceptive-drug interactions with anticonvulsants and antibiotics. Br J Clin Pharmacol 1988;25:527–32.
492. Back DJ, Tjia J, Martin C, et al. The lack of interaction between temafloxacin and combined oral contraceptive steroids. Contraception 1991;43:317–23.
493. Bacon JF, Shenfield GM. Pregnancy attributable to interaction between tetracycline and oral contraceptives. BMJ 1980;280:293.
494. Bainton R. Interaction between antibiotic therapy and contraceptive medication. Oral Surg Oral Med Oral Pathol 1986;61:453–5.
495. Bollen M. Use of antibiotics when taking the oral contraceptive pill [comment]. Aust Fam Physician 1995;24:928–9.
496. Bromham DR. Knowledge and use of secondary contraception among patients requesting termination of pregnancy. BMJ 1993;306:556–7.
497. Cote J. Interaction of griseofulvin and oral contraceptives [comment]. J Am Acad Dermatol 1990;22:124–5.
498. Csemiczky G, Alvendal C, Landgren BM. Risk for ovulation in women taking a low-dose oral contraceptive (Microgynon) when receiving antibacterial treatment with a fluoroquinoline (ofloxacin). Adv Contracept 1996;12:101–9.
499. de Groot AC, Eshuis H, Stricker BH. Inefficiency of oral contraception during use of minocycline [in Dutch]. Ned Tijdschr Geneeskd 1990;134:1227–9.
500. DeSano EA Jr, Hurley SC. Possible interactions of antihistamines and antibiotics with oral contraceptive effectiveness. Fertil Steril 1982;37:853–4.
501. Donley TG, Smith RF, Roy B. Reduced oral contraceptive effectiveness with concurrent antibiotic use: a protocol for prescribing antibiotics to women of childbearing age. Compendium 1990;11:392–6.
502. Friedman CI, Huneke AL, Kim MH, Powell J. The effect of ampicillin on oral contraceptive effectiveness. Obstet Gynecol 1980;55:33–7.
503. Grimmer SF, Allen WL, Back DJ, et al. The effect of cotrimoxazole on oral contraceptive steroids in women. Contraception 1983;28:53–9.
504. Helms SE, Bredle DL, Zajic J, et al. Oral contraceptive failure rates and oral antibiotics. J Am Acad Dermatol 1997;36:705–10.
505. Hempel E, Bohm W, Carol W, Klinger G. Enzyme induction by drugs and hormonal contraception [in German]. Zentralbl Gynakol 1973;95:1451–7.
506. Hempel E, Zorn C, Graf K. Effect of chemotherapy agents and antibiotics on hormonal contraception [in German]. Z Arztl Forbild (Jena) 1978;72:924–6.
507. Hetenyi G. Possible interactions between antibiotics and oral contraceptives. Ther Hung 1989;37:86–9.
508. Hughes BR, Cunliffe WJ. Interactions between the oral contraceptive pill and antibiotics [comment]. Br J Dermatol 1990;122:717–8.

509. Joshi JV, Joshi UM, Sankholi GM, et al. A study of interaction of low-dose combination oral contraceptive with ampicillin and metronidazole. Contraception 1980;22:643–52.
510. Kakouris H, Kovacs GT. Pill failure and nonuse of secondary precautions. Br J Fam Plann 1992;18:41–4.
511. Kakouris H, Kovacs GT. How common are predisposing factors to pill failure among pill users? Br J Fam Plann 1994;20:33–5.
512. Kovacs GT, Riddoch G, Duncombe P, et al. Inadvertent pregnancies in oral contraceptive users. Med J Aust 1989;150:549–51.
513. Lequeux A. Pregnancy under oral contraceptives after treatment with tetracycline] [in French]. Louv Med 1980;99:413–4.
514. London BM, Lookingbill DP. Frequency of pregnancy in acne patients taking oral antibiotics and oral contraceptives. Arch Dermatol 1994;130:392–3.
515. Maggiolo F, Puricelli G, Dottorini M, et al. The effects of ciprofloxacin on oral contraceptive steroid treatments. Drugs Exp Clin Res 1991;17:451–4.
516. Murphy AA, Zacur HA, Charache P, Burkman RT. The effect of tetracycline on levels of oral contraceptives. Am J Obstet Gynecol 1991;164:28–33.
517. Neely JL, Abate M, Swinker M, D'Angio R. The effect of doxycycline on serum levels of ethinyl estradiol, noretindrone, and endogenous progesterone. Obstet Gynecol 1991;77:416–20.
518. Pillans PI, Sparrow MJ. Pregnancy associated with a combined oral contraceptive and itraconazole [comment]. N Z Med J 1993;106:436.
519. Scholten PC, Droppert RM, Zwinkels MG, et al. No interaction between ciprofloxacin and an oral contraceptive. Antimicrob Agents Chemother 1998;42:3266–8.
520. Silber TJ. Apparent oral contraceptive failure associated with antibiotic administration. J Adolesc Health Care 1983;4:287–9.
521. Sparrow MJ. Pill method failures. N Z Med J 1987;100:102–5.
522. Sparrow MJ. Pregnancies in reliable pill takers. N Z Med J 1989;102:575–7.
523. Sparrow MJ. Pill method failures in women seeking abortion—fourteen years experience. N Z Med J 1998;111:386–8.
524. van Dijke CP, Weber JC. Interaction between oral contraceptives and griseofulvin. Br Med J (Clin Res Ed) 1984;288:1125–6.
525. Wermeling DP, Chandler MH, Sides GD, Collins D, Muse KN. Dirithromycin increases ethinyl estradiol clearance without allowing ovulation. Obstet Gynecol 1995;86:78–84.
526. Young LK, Farquhar CM, McCowan LM, Roberts HE, Taylor J. The contraceptive practices of women seeking termination of pregnancy in an Auckland clinic. N Z Med J 1994;107:189–92.
527. Abrams LS, Skee D, Natarajan J, Wong FA. Pharmocokinetic overview of Ortho Evra/Evra. Fertil Steril 2002;77:s3–s12.
528. Dogterom P, van den Heuvel MW, Thomsen T. Absence of pharmacokinetic interactions of the combined contraceptive vaginal ring NuvaRing with oral amoxicillin or doxycycline in two randomized trials. Clin Pharmacokinet 2005;44:429–38.
529. Devenport MH, Crook D, Wynn V, Lees LJ. Metabolic effects of low-dose fluconazole in healthy female users and non-users of oral contraceptives. Br J Clin Pharmacol 1989;27:851–9.
530. Hilbert J, Messig M, Kuye O. Evaluation of interaction between fluconazole and an oral contraceptive in healthy women. Obstet Gynecol 2001;98:218–23.
531. Kovacs I, Somos P, Hamori M. Examination of the potential interaction between ketoconazole (Nizoral) and oral contraceptives with special regard to products of low hormone content (Rigevidon, anteovin). Ther Hung 1986;34:167–70.
532. Lunell NO, Pschera H, Zador G, Carlstrom K. Evaluation of the possible interaction of the antifungal triazole SCH 39304 with oral contraceptives in normal health women. Gynecol Obstet Invest 1991;32:91–7.
533. McDaniel PA, Cladroney RD. Oral contraceptives and griseofulvin interactions. Drug Intell Clin Pharm 1986;20:384.
534. Meyboom RH, van Puijenbroek EP, Vinks MH, Lastdrager CJ. Disturbance of withdrawal bleeding during concomitant use of itraconazole and oral contraceptives. N Z Med J 1997;110:300.
535. Rieth H, Sauerbrey N. Interaction studies with fluconazole, a new tirazole antifungal drug [in German]. Wien Med Wochenschr 1989;139:370–4.
536. Sinofsky FE, Pasquale SA. The effect of fluconazole on circulating ethinyl estradiol levels in women taking oral contraceptives. Am J Obstet Gynecol 1998;178:300–4.
537. van Puijenbroek EP, Feenstra J, Meyboom RH. Pill cycle disturbance in simultaneous use of itraconazole and oral contraceptives [in Dutch]. Ned Tijedschr Geneeskd 1998;142:146–9.
538. van Puijenbroek EP, Egberts AC, Meyboom RH, Leufkens HG. Signalling possible drug-drug interactions in a spontaneous reporting system: delay of withdrawal bleeding during concomitant use of oral contraceptives and itraconazole. Br J Clin Pharmacol 1999;47:689–93.
539. Verhoeven CH, van den Heuvel MW, Mulders TM, Dieben TO. The contraceptive vaginal ring, NuvaRing, and antimycotic co-medication. Contraception 2004;69:129–32.
540. Back DJ, Breckenridge AM, Grimmer SF, Orme ML, Purba HS. Pharmacokinetics of oral contraceptive steroids following the administration of the antimalarial drugs primaquine and chloroquine. Contraception 1984;30:289–95.
541. Croft AM, Herxheimer A. Adverse effects of the antimalaria drug, mefloquine: due to primary liver damage with secondary thyroid involvement? BMC Public Health 2002;2:6.
542. Karbwang J, Looareesuwan S, Back DJ, Migasana S, Bunnag D. Effect of oral contraceptive steroids on the clinical course of malaria infection and on the pharmacokinetics of mefloquine in Thai women. Bull World Health Organ 1988;66:763–7.
543. McGready R, Stepniewska K, Seaton E, et al. Pregnancy and use of oral contaceptives reduces the biotransformation of proguanil to cycloguanil. Eur J Clin Pharmacol 2003;59:553–7.
544. Wanwimolruk S, Kaewvichit S, Tanthayaphinant O, Suwannarach C, Oranratnachai A. Lack of effect of oral contraceptive use on the pharmacokinetics of quinine. Br J Clin Pharmacol 1991;31:179–81.
545. Back DJ, Breckenridge AM, Crawford FE, et al. The effect of rifampicin on norethisterone pharmacokinetics. Eur J Clin Pharmacol 1979;15:193–7.
546. Back DJ, Breckenridge AM, Crawford FE, et al. The effect of rifampicin on the pharmacokinetics of ethynylestradiol in women. Contraception 1980;21:135–43.
547. Barditch-Crovo P, Trapnell CB, Ette E, et al. The effects of rifampicin and rifabutin on the pharmacokinetics and pharmacodynamics of a combination oral contraceptive. Clin Pharmacol Ther 1999;65:428–38.
548. Bolt HM, Bolt M, Kappus H. Interaction of rifampicin treatment with pharmacokinetics and metabolism of ethinyloestradiol in man. Acta Endocrinol (Copenh) 1977;85:189–97.
549. Gupta KC, Ali MY. Failure of oral contraceptive with rifampicin. Med J Zambia 1981;15:23.
550. Hirsch A. Sleeping pills [letter] [in French]. Nouv Presse Med 1973;2:2957.

551. Hirsch A, Tillement JP, Chretien J. Effets contrariants de la rifampicine sur les contraceptifs oraux: a propos de trois grossesses non desiree chez trois malades. Rev Fr Mal Respir 1975;2:174–82.
552. Joshi JV, Joshi UM, Sankholi GM, et al. A study of interaction of a low-dose combination oral contraceptive with anti-tubercular drugs. Contraception 1980;21:617–29.
553. Kropp R. Rifampicin and oral cotnraceptives (author's transl) [in German]. Prax Pneumol 1974;28:270–2.
554. LeBel M, Masson E, Guilbert E, et al. Effects of rifabutin and rifampicin on the pharmacokinetics of ethinylestradiol and norethindrone. J Clin Pharmacol 1998;38:1042–50.
555. Meyer B, Muller F, Wessels P, Maree J. A model to detect interactions between roxithromycin and oral contraceptives. Clin Pharmacol Ther 1990;47:671–4.
556. Nocke-Finke L, Breuer H, Reimers D. Effects of rifampicin on the menstrual cycle and on oestrogen excretion in patients taking oral contraceptives [in German]. Deutsche Med Wochenschr 1973;98:1521–3.
557. Piguet B, Muglioni JF, Chaline G. Oral contraception and rifampicin [letter] [in French]. Nouv Presse Med 1975;4:115–6.
558. Reimers D, Jezek A. The simultaneous use of rifampicin and other antitubercular agents with oral contraceptives [in German]. Prax Pneumol 1971;25:255–62.
559. Skolnick JL, Stoler BS, Katz DB, Anderson WH. Rifampicin, oral contraceptives, and pregnancy. JAMA 1976;236:1382.
560. Szoka PR, Edgren RA. Drug interactions with oral contraceptives: compilation and analysis of an adverse experience report database. Fertil Steril 1988;49:s31–s38.

Appendix C

Classifications for Progestin-Only Contraceptives

Classifications for progestin-only contraceptives (POCs) include those for progestin-only pills, depot medroxyprogesterone acetate, and progestin-only implants (Box). POCs do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

BOX. Categories for Classifying Progestin-Only Contraceptives

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for progestin-only contraceptives, including progestin-only pills, DMPA, and implants*†

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Personal Characteristics and Reproductive History				
Pregnancy	Not applicable	Not applicable	Not applicable	**Clarification:** Use of POCs is not required. There is no known harm to the woman, the course of her pregnancy, or the fetus if POCs are inadvertently used during pregnancy. However, the relation between DMPA use during pregnancy and its effects on the fetus remains unclear.
Age				
a. Menarche to <18 yrs	1	2	1	**Evidence:** Most studies have found that women lose BMD while using DMPA but regain BMD after discontinuing DMPA. It is not known whether DMPA use among adolescents affects peak bone mass levels or whether adult women with long duration of DMPA use can regain BMD to baseline levels before entering menopause. The relation between DMPA-associated changes in BMD during the reproductive years and future fracture risk is unknown (*1–41*). Studies find no effect or have inconsistent results about the effects of POCs other than DMPA on BMD (*42–54*).
b. 18–45 yrs	1	1	1	
c. >45 yrs	1	2	1	
Parity				
a. Nulliparous	1	1	1	
b. Parous	1	1	1	
Breastfeeding				**Clarification:** The U.S. Department of Health and Human Services recommends that infants be exclusively breastfed during the first 4–6 months of life, preferably for a full 6 months. Ideally, breastfeeding should continue through the first year of life (*55*).
a. <1 mo postpartum	2	2	2	
b. 1 mo to <6 mos postpartum	1	1	1	
c. ≥6 mos postpartum	1	1	1	**Evidence:** Despite anecdotal clinical reports that POCs might diminish milk production, direct evidence from available clinical studies demonstrates no significant negative effect of POCs on breastfeeding performance (*56–90*) or on the health of the infant (*66,70,72,76–81,91–93*). In general, these studies are of poor quality, lack standard definitions of breastfeeding or outcome measures, and have not included premature or ill infants. Theoretical concerns about effects of progestin exposure on the developing, neonatal brain are based on studies of progesterone effects in animals; whether similar effects occur after progestin exposure in human neonates is not known.

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Postpartum (in nonbreastfeeding women)				
a. <21 days	1	1	1	
b. ≥21 days	1	1	1	
Postabortion				**Clarification:** POCs may be started immediately postabortion.
a. First trimester	1	1	1	
b. Second trimester	1	1	1	**Evidence:** Limited evidence suggests that there are no adverse side effects when implants (Norplant) or progestin-only injectables (NET-EN) are initiated after first trimester abortion (*94–97*).
c. Immediate postseptic abortion	1	1	1	
Past ectopic pregnancy	2	1	1	**Comments:** POP users have a higher absolute rate of ectopic pregnancy than do users of other POCs but still less than using no method.
History of pelvic surgery	1	1	1	
Smoking				
a. Age <35 yrs	1	1	1	
b. Age ≥35 yrs				
i. <15 Cigarettes/day	1	1	1	
ii. ≥15 Cigarettes/day	1	1	1	
Obesity				
a. ≥30 kg/m^2 BMI	1	1	1	
b. Menarche to <18 yrs and ≥30 kg/m^2 BMI	1	2	1	**Evidence:** Obese adolescents who used DMPA were more likely than obese nonusers, obese COC users, and nonobese DMPA users to gain weight. These associations were not observed among adult women. One small study did not observe increases in weight gain among adolescent Norplant users by any category of baseline weight (*98–105*).
History of bariatric surgery§				
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	1	1	**Evidence:** Limited evidence demonstrated no substantial decrease in effectiveness of oral contraceptives among women who underwent laparoscopic placement of an adjustable gastric band (*106*).
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	3	1	1	**Evidence:** Limited evidence demonstrated no substantial decrease in effectiveness of oral contraceptives among women who underwent a biliopancreatic diversion (*107*); however, evidence from pharmacokinetic studies suggested conflicting results of oral contraceptive effectiveness among women who underwent a jejunoileal bypass (*108,109*). **Comment:** Bariatric surgical procedures involving a malabsorptive component have the potential to decrease oral contraceptive effectiveness, perhaps further decreased by postoperative complications, such as long-term diarrhea and/or vomiting.
Cardiovascular Disease				
Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, and hypertension)	2	3	2	**Clarification:** When multiple major risk factors exist, risk for cardiovascular disease might increase substantially. Some POCs might increase the risk for thrombosis, although this increase is substantially less than with COCs. The effects of DMPA might persist for some time after discontinuation.
Hypertension For all categories of hypertension, classifications are based on the assumption that no other risk factors exist for cardiovascular disease. When multiple risk factors do exist, risk for cardiovascular disease might increase substantially. A single reading of blood pressure level is not sufficient to classify a woman as hypertensive.				
a. Adequately controlled hypertension	1	2	1	**Clarification:** Women adequately treated for hypertension are at lower risk for acute myocardial infarction and stroke than are untreated women. Although no data exist, POC users with adequately controlled and monitored hypertension should be at lower risk for acute myocardial infarction and stroke than are untreated hypertensive POC users.

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
b. Elevated blood pressure levels (properly taken measurements)				
i. Systolic 140–159 mm Hg or diastolic 90–99 mm Hg	1	2	1	**Evidence:** Limited evidence suggests that among women with hypertension, those who used POPs or progestin-only injectables had a small increased risk for cardiovascular events than did women who did not use these methods (*110*).
ii. Systolic ≥160 mm Hg or diastolic ≥100 mm Hg§	2	3	2	
c. Vascular disease	2	3	2	**Comment:** Concern exists about hypo-estrogenic effects and reduced HDL levels, particularly among users of DMPA. However, there is little concern about these effects with regard to POPs. The effects of DMPA might persist for some time after discontinuation
History of high blood pressure during pregnancy (where current blood pressure is measurable and normal)	1	1	1	
Deep venous thrombosis (DVT)/ Pulmonary embolism (PE)				
a. History of DVT/PE, not on anticoagulant therapy				
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	2	2	2	
• History of estrogen-associated DVT/PE				
• Pregnancy-associated DVT/PE				
• Idiopathic DVT/PE				
• Known thrombophilia, including antiphospholipid syndrome				
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer				
• History of recurrent DVT/PE				
ii Lower risk for recurrent DVT/PE (no risk factors)	2	2	2	
b. Acute DVT/PE	2	2	2	**Evidence:** No direct evidence exists on use of POCs among women with acute DVT/PE. Although findings on the risk for venous thrombosis with use of POCs in otherwise healthy women is inconsistent, any small increased risk is substantially less than that with COCs (*110–112*).
c. DVT/PE and established on anticoagulant therapy for at least 3 mos				**Evidence:** No direct evidence exists on use of POCs among women with DVT/PE on anticoagulant therapy. Although findings on the risk for venous thrombosis with use of POCs are inconsistent in otherwise healthy women, any small increased risk is substantially less than that with COCs (*110–112*).
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	2	2	2	
• Known thrombophilia, including antiphospholipid syndrome				Limited evidence indicates that intramuscular injections of DMPA in women on chronic anticoagulation therapy does not pose a significant risk for hematoma at the injection site or increase the risk for heavy or irregular vaginal bleeding (*113*).
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer				
• History of recurrent DVT/PE				
ii. Lower risk for recurrent DVT/PE (no risk factors)	2	2	2	
d. Family history (first-degree relatives)	1	1	1	
e. Major surgery				
i. With prolonged immobilization	2	2	2	
ii. Without prolonged immobilization	1	1	1	
f. Minor surgery without immobilization	1	1	1	

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category POP	DMPA	Implants	Clarifications/Evidence/Comments
Known thrombogenic mutations§ (e.g., factor V Leiden; prothrombin mutation; protein S, protein C, and antithrombin deficiencies)	2	2	2	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening.
Superficial venous thrombosis				
a. Varicose veins	1	1	1	
b. Superficial thrombophlebitis	1	1	1	
Current and history of ischemic heart disease§	Initiation: 2 Continuation: 3	3	Initiation: 2 Continuation: 3	**Comment:** Concern exists about hypo-estrogenic effects and reduced HDL levels, particularly among users of DMPA. However, there is little concern about these effects with regard to POPs. The effects of DMPA might persist for some time after discontinuation.
Stroke§ (history of cerebrovascular accident)	Initiation: 2 Continuation: 3	3	Initiation: 2 Continuation: 3	**Comment:** Concern exists about hypo-estrogenic effects and reduced HDL levels, particularly among users of DMPA. However, there is little concern about these effects with regard to POPs. The effects of DMPA may persist for some time after discontinuation.
Known hyperlipidemias	2	2	2	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening. Some types of hyperlipidemias are risk factors for vascular disease.
Valvular heart disease				
a. Uncomplicated	1	1	1	
b. Complicated§ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)	1	1	1	
Peripartum cardiomyopathy§				
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (*114*)				**Evidence:** No direct evidence exists on the safety of POCs among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies of women with cardiac disease demonstrated few cases of hypertension, thromboembolism, and heart failure in women with cardiac disease using POPs and DMPA (*115,116*). **Comment:** Progestin-only implants might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.
i. <6 mos	1	1	1	
ii. ≥6 mos	1	1	1	
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (*114*)	2	2	2	**Evidence:** No direct evidence exists on the safety of POCs among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies of women with cardiac disease demonstrated few cases of hypertension, thromboembolism, and heart failure in women with cardiac disease using POPs and DMPA (*115,116*). **Comment:** Progestin-only implants might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category: POP	Category: DMPA	Category: Implants	Clarifications/Evidence/Comments
Rheumatic Diseases				
Systemic lupus erythematosus (SLE)§				Persons with SLE are at increased risk for ischemic heart disease, stroke, and VTE. Categories assigned to such conditions in the MEC should be the same for women with SLE who present with these conditions. For all categories of SLE, classifications are based on the assumption that no other risk factors for cardiovascular disease are present; these classifications must be modified in the presence of such risk factors. Many women with SLE can be considered good candidates for most contraceptive methods, including hormonal contraceptives (*117–135*).
a. Positive (or unknown) antiphospholipid antibodies	3	Initiation 3; Continuation 3	3	**Evidence:** Antiphospholipid antibodies are associated with a higher risk for both arterial and venous thrombosis (*136,137*).
b. Severe thrombocytopenia	2	3	2	2	**Comment:** Severe thrombocytopenia increases the risk for bleeding. POCs might be useful in treating menorrhagia in women with severe thrombocytopenia. However, given the increased or erratic bleeding that may be seen on initiation of DMPA and its irreversibility for 11–13 weeks after administration, initiation of this method in women with severe thrombocytopenia should be done with caution.
c. Immunosuppressive treatment	2	2	2	2	
d. None of the above	2	2	2	2	
Rheumatoid arthritis				
a. On immunosuppressive therapy	1	2/3	1	**Clarification:** DMPA use among women on long-term corticosteroid therapy with a history of, or with risk factors for, nontraumatic fractures is classified as Category 3. Otherwise, DMPA use for women with rheumatoid arthritis is classified as Category 2. **Evidence:** Limited evidence shows no consistent pattern of improvement or worsening of rheumatoid arthritis with use of oral contraceptives (*138–143*), progesterone (*144*), or estrogen (*145*).
b. Not on immunosuppressive therapy	1	2	1	
Neurologic Conditions				
Headaches	Initiation / Continuation	Initiation / Continuation	Initiation / Continuation	**Clarification:** Classification depends on accurate diagnosis of severe headaches that are migrainous and headaches that are not. Any new headaches or marked changes in headaches should be evaluated. Classification is for women without any other risk factors for stroke. Risk for stroke increases with age, hypertension, and smoking. **Comment:** Aura is a specific focal neurologic symptom. For more information about this and other diagnostic criteria, see: Headache Classification Subcommittee of the International Headache Society. The international classification of headache disorders. 2nd Ed. Cephalalgia. 2004;24 (Suppl 1):1–150. http://www.i-h-s.org/upload/ct_clas/ihc_II_main_no_print.pdf. Concern exists that severe headaches might increase with use of DMPA and implants. The effects of DMPA may persist for some time after discontinuation.
a. Non-migrainous (mild or severe)	1 / 1	1 / 1	1 / 1	
b. Migraine				
i. Without aura				
• Age <35 yrs	1 / 2	2 / 2	2 / 2	
• Age ≥35 yrs	1 / 2	2 / 2	2 / 2	
ii. With aura, at any age	2 / 3	2 / 3	2 / 3	
Epilepsy§	1	1	1	**Clarification:** If a woman is taking anticonvulsants, refer to the section on drug interactions. Certain anticonvulsants lower POC effectiveness.
Depressive Disorders				
Depressive disorders	1	1	1	**Clarification:** The classification is based on data for women with selected depressive disorders. No data on bipolar disorder or postpartum depression were available. A potential exists for drug interactions between certain antidepressant medications and hormonal contraceptives. **Evidence:** POC use did not increase depressive symptoms in women with depression compared with baseline (*146–149*).

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Reproductive Tract Infections and Disorders				
Vaginal bleeding patterns				
a. Irregular pattern without heavy bleeding	2	2	2	**Comment:** Irregular menstrual bleeding patterns are common among healthy women. POC use frequently induces an irregular bleeding pattern. Implant use might induce irregular bleeding patterns, especially during the first 3–6 months, but these patterns may persist longer.
b. Heavy or prolonged bleeding (includes regular and irregular patterns)	2	2	2	**Clarification:** Unusually heavy bleeding should raise the suspicion of a serious underlying condition.
Unexplained vaginal bleeding (suspicious for serious condition)				**Clarification:** If pregnancy or an underlying pathological condition (such as pelvic malignancy) is suspected, it must be evaluated and the category adjusted after evaluation.
Before evaluation	2	3	3	**Comment:** POCs might cause irregular bleeding patterns, which might mask symptoms of underlying pathology. The effects of DMPA might persist for some time after discontinuation.
Endometriosis	1	1	1	
Benign ovarian tumors (including cysts)	1	1	1	
Severe dysmenorrhea	1	1	1	
Gestational trophoblastic disease				
a. Decreasing or undetectable β–hCG levels	1	1	1	
b. Persistently elevated β-hCG levels or malignant disease§	1	1	1	
Cervical ectropion	1	1	1	
Cervical intraepithelial neoplasia	1	2	2	**Evidence:** Among women with persistent HPV infection, long-term DMPA use (≥5 years) might increase the risk for carcinoma in situ and invasive carcinoma (*150*).
Cervical cancer (awaiting treatment)	1	2	2	**Comment:** Theoretical concern exists that POC use might affect prognosis of the existing disease. While awaiting treatment, women may use POCs. In general, treatment of this condition can render a woman sterile.
Breast disease				
a. Undiagnosed mass	2	2	2	**Clarification:** Evaluation should be pursued as early as possible.
b. Benign breast disease	1	1	1	
c. Family history of cancer	1	1	1	
d. Breast cancer§				
i. Current	4	4	4	**Comment:** Breast cancer is a hormonally sensitive tumor, and the prognosis for women with current or recent breast cancer might worsen with POC use.
ii. Past and no evidence of current disease for 5 years	3	3	3	
Endometrial hyperplasia	1	1	1	
Endometrial cancer§	1	1	1	**Comment:** While awaiting treatment, women may use POCs. In general, treatment of this condition renders a woman sterile.
Ovarian cancer§	1	1	1	**Comment:** While awaiting treatment, women may use POCs. In general, treatment of this condition can render a woman sterile.
Uterine fibroids	1	1	1	**Comment:** POCs do not appear to cause growth of uterine fibroids.

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Pelvic inflammatory disease (PID)				
a. Past PID (assuming no current risk factors for STIs)				**Comment:** Whether POCs, like COCs, reduce the risk for PID among women with STIs is unknown, but they do not protect against HIV or lower genital tract STI.
i. With subsequent pregnancy	1	1	1	
ii. Without subsequent pregnancy	1	1	1	
b. Current PID	1	1	1	
STIs				
a. Current purulent cervicitis or chlamydial infection or gonorrhea	1	1	1	
b. Other STIs (excluding HIV and hepatitis)	1	1	1	
c. Vaginitis (including *Trichomonas vaginalis* and bacterial vaginosis)	1	1	1	
d. Increased risk for STIs	1	1	1	**Evidence:** Evidence suggests a possible increased risk for chlamydial cervicitis among DMPA users at high risk for STIs. For other STIs, either evidence exists of no association between DMPA use and STI acquisition or evidence is too limited to draw any conclusions. No evidence is available about other POCs (*151–158*)
HIV/AIDS				
High risk for HIV	1	1	1	**Evidence:** The balance of the evidence suggests no association between POC use and HIV acquisition, although findings from studies of DMPA use conducted among higher risk populations have been inconsistent (*159–183*).
HIV infection§	1	1	1	**Evidence:** Most studies suggest no increased risk for HIV disease progression with hormonal contraceptive use, as measured by changes in CD4 cell count, viral load, or survival. Studies observing that women with HIV who use hormonal contraception have increased risks for STIs are generally consistent with reports among uninfected women. One direct study found no association between hormonal contraceptive use and increased risk for HIV transmission to uninfected partners; several indirect studies reported mixed results about whether hormonal contraception is associated with increased risk for HIV-1 DNA or RNA shedding from the genital tract (*171,184–200*).
AIDS§	1	1	1	**Clarification:** Drug interactions might exist between hormonal contraceptives and ARV drugs; refer to the section on drug interactions.
Other Infections				
Schistosomiasis				
a. Uncomplicated	1	1	1	**Evidence:** Among women with uncomplicated schistosomiasis, limited evidence showed that DMPA use had no adverse effects on liver function (*201*).
b. Fibrosis of liver§ (if severe, see cirrhosis)	1	1	1	
Tuberculosis§				**Clarification:** If a woman is taking rifampicin, refer to the section on drug interactions. Rifampicin is likely to decrease the effectiveness of some POCs.
a. Nonpelvic	1	1	1	
b. Pelvic	1	1	1	
Malaria	1	1	1	

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Endocrine Conditions				
Diabetes				
a. History of gestational disease	1	1	1	**Evidence:** POCs had no adverse effects on serum lipid levels in women with a history of gestational diabetes in 2 small studies. (*202,203*) Limited evidence is inconsistent about the development of noninsulin-dependant diabetes among users of POCs with a history of gestational diabetes (*204–207*).
b. Nonvascular disease				
i. Noninsulin-dependent	2	2	2	**Evidence:** Among women with insulin- or noninsulin-dependent diabetes, limited evidence on use of POCs (POPs, DMPA, LNG implant) suggests that these methods have little effect on short-term or long-term diabetes control (e.g., glycosylated hemoglobin levels), hemostatic markers, or lipid profile (*208–211*).
ii. Insulin-dependent§	2	2	2	
c. Nephropathy/retinopathy/ neuropathy§	2	3	2	**Comment:** Concern exists about hypo-estrogenic effects and reduced HDL levels, particularly among users of DMPA. The effects of DMPA might persist for some time after discontinuation. Some POCs might increase the risk for thrombosis, although this increase is substantially less than with COCs.
d. Other vascular disease or diabetes of >20 yrs' duration§	2	3	2	**Comment:** Concern exists about hypo-estrogenic effects and reduced HDL levels, particularly among users of DMPA. The effects of DMPA might persist for some time after discontinuation. Some POCs might increase the risk for thrombosis, although this increase is substantially less than with COCs.
Thyroid disorders				
a. Simple goiter	1	1	1	
b. Hyperthyroid	1	1	1	
c. Hypothyroid	1	1	1	
Gastrointestinal Conditions				
Inflammatory bowel disease (IBD) (ulcerative colitis, Crohn disease)	2	2	1	**Evidence:** Risk for disease relapse among women with IBD using oral contraceptives (most studies did not specify formulation) did not increase significantly from that for nonusers (*212–216*). **Comment:** Absorption of POPs among women with IBD might be reduced if the woman has substantial malabsorption caused by severe disease or small bowel surgery. Women with IBD have a higher prevalence than the general population of osteoporosis and osteopenia. Use of DMPA, which has been associated with small changes in BMD, might be of concern.
Gallbladder disease				
a. Symptomatic				
i. Treated by cholecystectomy	2	2	2	
ii. Medically treated	2	2	2	
iii. Current	2	2	2	
b. Asymptomatic	2	2	2	
History of cholestasis				
a. Pregnancy-related	1	1	1	
b. Past COC–related	2	2	2	**Comment:** Theoretically, a history of COC-related cholestasis might predict subsequent cholestasis with POC use. However, this has not been documented.
Viral hepatitis				
a. Acute or flare	1	1	1	
b. Carrier	1	1	1	
c. Chronic	1	1	1	

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Cirrhosis				
a. Mild (compensated)	1	1	1	
b. Severe§ (decompensated)	3	3	3	
Liver tumors				
a. Benign				**Evidence:** Limited direct evidence suggests that hormonal contraceptive use does not influence either progression or regression of liver lesions among women with focal nodular hyperplasia (*217,218*).
i. Focal nodular hyperplasia	2	2	2	
ii. Hepatocellular adenoma§	3	3	3	
b. Malignant§ (hepatoma)	3	3	3	**Comment:** No evidence is available about hormonal contraceptive use among women with hepatocellular adenoma. COC use in healthy women is associated with development and growth of hepatocellular adenoma; whether other hormonal contraceptives have similar effects is not known.
Anemias				
Thalassemia	1	1	1	
Sickle cell disease§	1	1	1	**Evidence:** Among women with sickle cell disease, POC use did not have adverse effects on hematologic parameters and, in some studies, was beneficial with respect to clinical symptoms (*219–226*).
Iron deficiency anemia	1	1	1	**Comment:** Changes in the menstrual pattern associated with POC use have little effect on hemoglobin levels.
Solid Organ Transplantation				
Solid organ transplantaton§				
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	2	2	2	
b. Uncomplicated	2	2	2	
Drug Interactions				
Antiretroviral (ARV) therapy				**Clarification:** ARV drugs have the potential to either decrease or increase the bioavailability of steroid hormones in hormonal contraceptives. Limited data (Appendix M) suggest potential drug interactions between many ARV drugs (particularly some NNRTIs and ritonavir-boosted protease inhibitors) and hormonal contraceptives. These interactions may alter the safety and effectiveness of both the hormonal contraceptive and the ARV drug. Thus, if a woman on ARV treatment decides to initiate or continue hormonal contraceptive use, the consistent use of condoms is recommended to both prevent HIV transmission and compensate for any possible reduction in the effectiveness of the hormonal contraceptive.
a. Nucleoside reverse transcriptase inhibitors (NRTIs)	1	1	1	
b. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	2	1	2	
c. Ritonavir-boosted protease inhibitors	3	1	2	
Anticonvulsant therapy				
a. Certain anticonvulsants (phenytoin, carbamazepine, barbiturates, primidone, topiramate, oxcarbazepine)	3	1	2	**Clarification:** Although the interaction of certain anticonvulsants with POPs and ETG implants is not harmful to women, it is likely to reduce the effectiveness of POPs and ETG implants. Whether increasing the hormone dose of POPs alleviates this concern remains unclear. Use of other contraceptives should be encouraged for women who are long-term users of any of these drugs. Use of DMPA is a Category 1 because its effectiveness is not decreased by use of certain anticonvulsants. **Evidence:** Use of certain anticonvulsants may decrease the effectiveness of POCs (*227–229*)
b. Lamotrigine	1	1	1	**Evidence:** No drug interactions have been reported among epileptic women taking lamotrigine and using POCs (*230*)

TABLE. (*Continued*) Classifications for progestin-only contraceptives,*† including progestin-only pills, DMPA, and implants

Condition	Category			Clarifications/Evidence/Comments
	POP	DMPA	Implants	
Antimicrobial therapy				
a. Broad-spectrum antibiotics	1	1	1	
b. Antifungals	1	1	1	
c. Antiparasitics	1	1	1	
d. Rifampicin or rifabutin therapy	3	1	2	**Clarification:** Although the interaction of rifampicin or rifabutin with POPs and ETG implants is not harmful to women, it is likely to reduce the effectiveness of POPs and ETG implants. Use of other contraceptives should be encouraged for women who are long-term users of any of these drugs. Use of DMPA is a Category 1 because its effectiveness is not decreased by use of rifampicin or rifabutin. Whether increasing the hormone dose of POPs alleviates this concern remains unclear.

* Abbreviations: STI = sexually transmitted infection; HIV = human immunodeficiency virus; POC = progestin-only contraceptive; DMPA = depot medroxyprogesterone acetate; BMD = bone mineral density; NET-EN = norethisterone enantate; BMI = body mass index; COC = combined oral contraceptive; HDL = high-density lipoprotein; POP = progestin-only pill; DVT = deep venous thrombosis; PE = pulmonary embolism; SLE = systemic lupus erythematosus; VTE = venous thromboembolism; MEC = Medical Eligibility Criteria; hCG = human chorionic gonadotropin; HPV = human papillomavirus; PID = pelvic inflammatory disease; AIDS = acquired immunodeficiency syndrome; IBD = inflammatory bowel disease; ARV = antiretroviral; LNG = levonorgestrel; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase inhibitor; ETG = etonogestrel.

† POCs do not protect against STI/HIV. If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

References

1. Albertazzi P, Bottazzi M, Steel SA. Bone mineral density and depot medroxyprogesterone acetate. Contraception 2006;73:577–83.
2. Banks E, Berrington A, Casabonne D. Overview of the relationship between use of progestogen-only contraceptives and bone mineral density. BJOG Br J Obstet Gynaecol 2001;108:1214–21.
3. Beksinska M, Smit J, Kleinschmidt I, Farley T, Mbatha F. Bone mineral density in women aged 40–49 years using depot-medroxyprogesterone acetate, norethisterone enanthate or combined oral contraceptives for contraception. Contraception 2005;71:170–5.
4. Beksinska ME, Kleinschmidt I, Smit JA, Farley TM. Bone mineral density in adolescents using norethisterone enanthate, depot-medroxyprogesterone acetate or combined oral contraceptives for contraception. Contraception 2007;75:438–43.
5. Berenson AB, Breitkopf CR, Grady JJ, Rickert VI, Thomas A. Effects of hormonal contraception on bone mineral density after 24 months of use. Obstet Gynecol 2004;103:899–906.
6. Busen NH, Britt RB, Rianon N. Bone mineral density in a cohort of adolescent women using depot medroxyprogesterone acetate for one to two years. J Adolesc Health 2003;32:257–9.
7. Clark MK, Sowers M, Levy B, Nichols S. Bone mineral density loss and recovery during 48 months in first-time users of depot medroxyprogesterone acetate. Fertil Steril 2006;86:1466–74.
8. Cromer BA, Blair JM, Mahan JD, Zibners L, Naumovski Z. A prospective comparison of bone density in adolescent girls receiving depot medroxyprogesterone acetate (Depo-Provera), levonorgestrel (Norplant), or oral contraceptives. J Pediatr 1996;129:671–6.
9. Cromer BA, Stager M, Bonny A, et al. Depot medroxyprogesterone acetate, oral contraceptives and bone mineral density in a cohort of adolescent girls. J Adolesc Health 2004;35:434–41.
10. Cromer BA, Lazebnik R, Rome E, et al. Double-blinded randomized controlled trial of estrogen supplementation in adolescent girls who receive depot medroxyprogesterone acetate for contraception. Am J Obstet Gynecol 2005;192:42-7.
11. Cromer BA, Bonny AE, Stager M, et al. Bone mineral density in adolescent females using injectable or oral contraceptives: a 24-month prospective study. Fertil Steril 2008.
12. Cundy T, Cornish J, Evans MC, Roberts H, Reid IR. Recovery of bone density in women who stop using medroxyprogesterone acetate. BMJ 1994;308:247–8.
13. Cundy T, Cornish J, Roberts H, Elder H, Reid IR. Spinal bone density in women using depot medroxyprogesterone contraception. Obstet Gynecol 1998;92:569–73.
14. Cundy T, Cornish J, Roberts H, Reid IR. Menopausal bone loss in long-term users of depot medroxyprogesterone acetate contraception. Am J Obstet Gynecol 2002;186:978–83.
15. Cundy T, Ames R, Horne A, et al. A randomized controlled trial of estrogen replacement therapy in long-term users of depot medroxyprogesterone acetate. J Clin Endocrinol Metab 2003;88:78–81.
16. Gbolade B, Ellis S, Murby B, Randall S, Kirkman R. Bone density in long term users of depot medroxyprogesterone acetate. Br J Obstet Gynaecol 1998;105:790–4.
17. Kaunitz AM, Miller PD, Rice VM, Ross D, McClung MR. Bone mineral density in women aged 25–35 years receiving depot medroxyprogesterone acetate: recovery following discontinuation. Contraception 2006;74:90–9.
18. Kaunitz AM, Arias R, McClung M. Bone density recovery after depot medroxyprogesterone acetate injectable contraception use. Contraception 2008;77:67–76.
19. Lappe JM, Stegman MR, Recker RR. The impact of lifestyle factors on stress fractures in female Army recruits. Osteopor Int 2001;12:35–42.
20. Lara-Torre E, Edwards CP, Perlman S, Hertweck SP. Bone mineral density in adolescent females using depot medroxyprogesterone acetate. J Pediatr Adolesc Gynecol 2004;17:17–21.
21. Lopez LM, Grimes DA, Schulz KF, Curtis KM. Steroidal contraceptives: effect on bone fractures in women. Cochrane Database Syst Rev 2006;CD006033.
22. McGough P, Bigrigg A. Effect of depot medroxyprogesterone acetate on bone density in a Scottish industrial city. Eur J Contracept Reprod Health Care 2007;12:253–9.
23. Merki-Feld GS, Neff M, Keller PJ. A 2-year prospective study on the effects of depot medroxyprogesterone acetate on bone mass-response to estrogen and calcium therapy in individual users. Contraception 2003;67:79–86.

24. Orr-Walker BJ, Evans MC, Ames RW, et al. The effect of past use of the injectable contraceptive depot medroxyprogesterone acetate on bone mineral density in normal postmenopausal women. Clini Endocrinol 1998;49:615–8.
25. Ott SM, Scholes D, LaCroix AZ, et al. Effects of contraceptive use on bone biochemical markers in young women. J Clin Endocrinol Metab 2001;86:179–85.
26. Paiva LC, Pinto-Neto AM, Faundes A. Bone density among long-term users of medroxyprogesterone acetate as a contraceptive. Contraception 1998;58:351–5.
27. Perrotti M, Bahamondes L, Petta C, Castro S. Forearm bone density in long-term users of oral combined contraceptives and depot medroxyprogesterone acetate. Fertil Steril 2001;76:469–73.
28. Petitti DB, Piaggio G, Mehta S, Cravioto MC, Meirik O. Steroid hormone contraception and bone mineral density: a cross-sectional study in an international population. The WHO Study of Hormonal Contraception and Bone Health. Obstet Gynecol 2000;95:736–44.
29. Rosenberg L, Zhang Y, Constant D, et al. Bone status after cessation of use of injectable progestin contraceptives. Contraception 2007;76:425–31.
30. Scholes D, LaCroix AZ, Ott SM, Ichikawa LE, Barlow WE. Bone mineral density in women using depot medroxyprogesterone acetate for contraception. Obstet Gynecol 1999;93:233–8.
31. Scholes D, LaCroix AZ, Ichikawa LE, Barlow WE, Ott SM. Injectable hormone contraception and bone density: results from a prospective study. Epidemiology 2002;13:581–7.
32. Scholes D, LaCroix AZ, Ichikawa LE, Barlow WE, Ott SM. The association between depot medroxyprogesterone acetate contraception and bone mineral density in adolescent women. Contraception 2004;69:99–104.
33. Scholes D, LaCroix AZ, Ichikawa LE, Barlow WE, Ott SM. Change in bone mineral density among adolescent women using and discontinuing depot medroxyprogesterone acetate contraception. Arch Pediatr Adolesc Med 2005;159:139–44.
34. Shaarawy M, El-Mallah SY, Seoudi S, Hassan M, Mohsen IA. Effects of the long-term use of depot medroxyprogesterone acetate as hormonal contraceptive on bone mineral density and biochemical markers of bone remodeling. Contraception 2006;74:297–302.
35. Tang OS, Tang G, Yip P, Li B, Fan S. Long-term depot-medroxyprogesterone acetate and bone mineral density. Contraception 1999;59:25–9.
36. Tang OS, Tang G, Yip PS, Li B. Further evaluation on long-term depot-medroxyprogesterone acetate use and bone mineral density: a longitudinal cohort study. Contraception 2000;62:161–4.
37. Tharnprisarn W, Taneepanichskul S. Bone mineral density in adolescent and young Thai girls receiving oral contraceptives compared with depot medroxyprogesterone acetate: a cross-sectional study in young Thai women. Contraception 2002;66:101–3.
38. Virutamasen P, Wangsuphachart S, Reinprayoon D, et al. Trabecular bone in long-term depot-medroxyprogesterone acetate users. Asia-Oceania J Obstet Gynaecol 1994;20:269–74.
39. Walsh JS, Eastell R, Peel NF. Effects of depot medroxyprogesterone acetate on bone density and bone metabolism before and after peak bone mass: a case-control study. J Clin Endocrinol Metab 2008.
40. Wanichsetakul P, Kamudhamas A, Watanaruangkovit P, Siripakarn Y, Visutakul P. Bone mineral density at various anatomic bone sites in women receiving combined oral contraceptives and depot-medroxyprogesterone acetate for contraception. Contraception 2002;65:407–10.
41. Wetmore CM, Ichikawa L, LaCroix AZ, Ott SM, Scholes D. Association between caffeine intake and bone mass among young women: potential effect modification by depot medroxyprogesterone acetate use. Osteoporos Int 200819:519–27.
42. Bahamondes L, Perrotti M, Castro S, et al. Forearm bone density in users of Depo-Provera as a contraceptive method. Fertil Steril 1999;71:849–52.
43. Bahamondes L, Monteiro-Dantas C, Espejo-Arce X, et al. A prospective study of the forearm bone density of users of etonorgestrel- and levonorgestrel-releasing contraceptive implants. Hum Reprod 2006;21:466–70.
44. Bahamondes L, Espejo-Arce X, Hidalgo MM, et al. A cross-sectional study of the forearm bone density of long-term users of levonorgestrel-releasing intrauterine system. Hum Reprod 2006;21:1316–9.
45. Beerthuizen R, van Beek A, Massai R, et al. Bone mineral density during long-term use of the progestagen contraceptive implant Implanon compared to a non-hormonal method of contraception. Hum Reprod 2000;15:118–22.
46. Caird LE, Reid-Thomas V, Hannan WJ, Gow S, Glasier AF. Oral progestogen-only contraception may protect against loss of bone mass in breast-feeding women. Clin Endocrinol (Oxf) 1994;41:739–45.
47. Di X, Li Y, Zhang C, Jiang J, Gu S. Effects of levonorgestrel-releasing subdermal contraceptive implants on bone density and bone metabolism. Contraception 1999;60:161–6.
48. Diaz S, Reyes MV, Zepeda A, et al. Norplant((R)) implants and progesterone vaginal rings do not affect maternal bone turnover and density during lactation and after weaning. Hum Reprod 1999;14:2499–505.
49. Intaraprasert S, Taneepanichskul S, Theppisai U, Chaturachinda K. Bone density in women receiving Norplant implants for contraception. J Med Assoc Thai 1997;80:738–41.
50. Monteiro-Dantas C, Espejo-Arce X, Lui-Filho JF, et al. A three-year longitudinal evaluation of the forearm bone density of users of etonogestrel- and levonorgestrel-releasing contraceptive implants. Reprod Health 2007;4:11.
51. Naessen T, Olsson SE, Gudmundson J. Differential effects on bone density of progestogen-only methods for contraception in premenopausal women. Contraception 1995;52:35–9.
52. Taneepanichskul S, Intaraprasert S, Theppisai U, Chaturachinda K. Bone mineral density during long-term treatment with Norplant implants and depot medroxyprogesterone acetate. A cross-sectional study of Thai women. Contraception 1997;56:153–5.
53. Taneepanichskul S, Intaraprasert S, Theppisai U, Chaturachinda K. Bone mineral density in long-term depot medroxyprogesterone acetate acceptors. Contraception 1997;56:1–3.
54. Vanderjagt DJ, Sagay AS, Imade GE, Farmer SE, Glew RH. Effect of Norplant contraceptive on the bones of Nigerian women as assessed by quantitative ultrasound and serum markers of bone turnover. Contraception 2005;72:212–6.
55. Office on Women's Health, US Department of Health and Human Services. HHS blueprint for action on breastfeeding. Washington, DC: US Department of Health and Human Services, Office on Women's Health; 2000.
56. Guiloff E, Ibarrapo A, Zanartu J, et al. Effect of contraception on lactation. Am J Obstet Gynecol 1974;118:42–5.
57. World Health Organization Special Programme of Research Development and Research Training in human reproduction. Effects of hormonal contraceptives on milk volume and infant growth. Contraception 1984;30:505–22.
58. Heikkila M, Luukkainen T. Duration of breast-feeding and development of children after insertion of a levonorgestrel-releasing intrauterine contraceptive device. Contraception 1982;25:279–92.
59. Giner VJ, Cortes G, V, Sotelo LA, Bondani G. Effect of daily oral administration of 0.350 mg of norethindrone on lactation and on the composition of milk [in Spanish]. Ginecol Obstet Mex 1976;40:31–9.
60. Zacharias S, Aguilera E, Assenzo JR, Zanartu J. Effects of hormonal and nonhormonal contraceptives on lactation and incidence of pregnancy. Contraception 1986;33:203–13.
61. Kamal I, Hefnawi F, Ghoneim M, Abdallah M, Abdel RS. Clinical, biochemical, and experimental studies on lactation. V. Clinical effects of steroids on the initiation of lactation. Am J Obstet Gynecol 1970;108:655–8.

62. Hannon PR, Duggan AK, Serwint JR, et al. The influence of medroxyprogesterone on the duration of breast-feeding in mothers in an urban community. Arch Pediatr Adolesc Med 1997;151:490–6.
63. Halderman LD, Nelson AL. Impact of early postpartum administration of progestin-only hormonal contraceptives compared with nonhormonal contraceptives on short-term breast-feeding patterns. Am J Obstet Gynecol 2002;186:1250–6.
64. Narducci U, Piatti N. Use of Depo Provera as a contraceptive in the puerperium [in Italian]. Minerva Ginecol 1973;25:107–11.
65. Melis GB, Strigini F, Fruzzetti F, et al. Norethisterone enanthate as an injectable contraceptive in puerperal and non-puerperal women. Contraception 1981;23:77–88.
66. Karim M, Ammar R, El-mahgoub S, et al. Injected progestogen and lactation. Br Med J 1971;1:200–3.
67. Shaaban MM. Contraception with progestogens and progesterone during lactation. J Steroid Biochem Mol Biol 1991;40:705–10.
68. Zanartu J, Aguilera E, Munoz-Pinto G. Maintenance of lactation by means of continuous low-dose progestogen given post-partum as a contraceptive. Contraception 1976;13:313–8.
69. McEwan JA, Joyce DN, Tothill AU, Hawkins DF. Early experience in contraception with a new progestogen. Contraception 1977;16:339–50.
70. McCann MF, Moggia AV, Higgins JE, Potts M, Becker C. The effects of a progestin-only oral contraceptive (levonorgestrel 0.03 mg) on breast-feeding. Contraception 1989;40:635–48.
71. West CP. The acceptability of a progestagen-only contraceptive during breast-feeding. Contraception 1983;27:563–9.
72. Bjarnadottir RI, Gottfredsdottir H, Sigurdardottir K, Geirsson RT, Dieben TO. Comparative study of the effects of a progestogen-only pill containing desogestrel and an intrauterine contraceptive device in lactating women. BJOG 2001;108:1174–80.
73. Taneepanichskul S, Reinprayoon D, Thaithumyanon P, et al. Effects of the etonogestrel-releasing implant Implanon and a nonmedicated intrauterine device on the growth of breast-fed infants. Contraception 2006;73:368–71.
74. Reinprayoon D, Taneepanichskul S, Bunyavejchevin S, et al. Effects of the etonogestrel-releasing contraceptive implant (Implanon(R)) on parameters of breastfeeding compared to those of an intrauterine device. Contraception 2000;62:239–46.
75. Seth U, Yadava HS, Agarwal N, Laumas KR, Hingorani V. Effect of a subdermal silastic implant containing norethindrone acetate on human lactation. Contraception 1977;16:383–98.
76. Shaaban MM, Salem HT, Abdullah KA. Influence of levonorgestrel contraceptive implants, NORPLANT, initiated early postpartum upon lactation and infant growth. Contraception 1985;32:623–35.
77. Abdel-Aleem H, Abol-Oyoun SM, Shaaban MM, et al. The use of nomegestrol acetate subdermal contraceptive implant, uniplant, during lactation. Contraception 1996;54:281–6.
78. Croxatto HB, Diaz S, Peralta O, et al. Fertility regulation in nursing women. II. Comparative performance of progesterone implants versus placebo and copper T. Am J Obstet Gynecol 1982;144:201–8.
79. Diaz S, Peralta O, Juez G, et al. Fertility regulation in nursing women. VI. Contraceptive effectiveness of a subdermal progesterone implant. Contraception 1984;30:311–25.
80. Sivin I, Diaz S, Croxatto HB, et al. Contraceptives for lactating women: a comparative trial of a progesterone-releasing vaginal ring and the copper T 380A IUD. Contraception 1997;55:225–32.
81. Massai R, Miranda P, Valdes P, et al. Preregistration study on the safety and contraceptive efficacy of a progesterone-releasing vaginal ring in Chilean nursing women. Contraception 1999;60:9–14.
82. Shaamash AH, Sayed GH, Hussien MM, Shaaban MM. A comparative study of the levonorgestrel-releasing intrauterine system Mirena(R) versus the Copper T380A intrauterine device during lactation: breast-feeding performance, infant growth and infant development. Contraception 2005;72:346–51.
83. WHO Special Programme of Research Development and Research Training in Human Reproduction. Progestogen-only contraceptives during lactation: II. Infant development. World Health Organization, Task Force for Epidemiological Research on Reproductive Health; Special Programme of Research, Development, and Research Training in Human Reproduction. Contraception 1994;50:55–68.
84. WHO Special Programme of Research Development and Research Training in Human Reproduction. Progestogen-only contraceptives during lactation: I. Infant growth. World Health Organization Task force for Epidemiological Research on Reproductive Health; Special Programme of Research, Development and Research Training in Human Reproduction. Contraception 1994;50:35–53.
85. Diaz S, Zepeda A, Maturana X, et al. Fertility regulation in nursing women: IX. Contraceptive performance, duration of lactation, infant growth, and bleeding patterns during use of progesterone vaginal rings, progestin-only pills, Norplant(R) implants, and Copper T 380-A intrauterine devices. Contraception 1997;56:223–32.
86. Coutinho EM, Athayde C, Dantas C, Hirsch C, Barbosa I. Use of a single implant of elcometrine (ST-1435), a nonorally active progestin, as a long acting contraceptive for postpartum nursing women. Contraception 1999;59:115–22.
87. Massai MR, Diaz S, Quinteros E, et al. Contraceptive efficacy and clinical performance of Nestorone implants in postpartum women. Contraception 2001;64:369–76.
88. Schiappacasse V, Diaz S, Zepeda A, Alvarado R, Herreros C. Health and growth of infants breastfed by Norplant contraceptive implants users: a six-year follow-up study. Contraception 2002;66:57–65.
89. Diaz S, Herreros C, Juez G, et al. Fertility regulation in nursing women: VII. Influence of NORPLANT levonorgestrel implants upon lactation and infant growth. Contraception 1985;32:53–74.
90. Massai R, Quinteros E, Reyes MV, et al. Extended use of a progesterone-releasing vaginal ring in nursing women: a phase II clinical trial. Contraception 2005;72:352–7.
91. Jimenez J, Ochoa M, Soler MP, Portales P. Long-term follow-up of children breast-fed by mothers receiving depot-medroxyprogesterone acetate. Contraception 1984;30:523–33.
92. Abdulla KA, Elwan SI, Salem HS, Shaaban MM. Effect of early postpartum use of the contraceptive implants, NORPLANT, on the serum levels of immunoglobulins of the mothers and their breastfed infants. Contraception 1985;32:261–6.
93. Shikary ZK, Betrabet SS, Toddywala WS, et al. Pharmacodynamic effects of levonorgestrel (LNG) administered either orally or subdermally to early postpartum lactating mothers on the urinary levels of follicle stimulating hormone (FSH), luteinizing hormone (LH) and testosterone (T) in their breast-fed male infants. Contraception 1986;34:403–12.
94. Kurunmaki H. Contraception with levonorgestrel-releasing subdermal capsules, Norplant, after pregnancy termination. Contraception 1983;27:473–82.
95. Kurunmaki H, Toivonen J, Lähteenmäki PL, Luukkainen T. Immediate postabortal contraception with Norplant: levonorgestrel, gonadotropin, estradiol, and progesterone levels over two postaboral months and return of fertility after removal of Norplant capsules. Contraception 1984;30:431-42.
96. Lahteenmaki P, Toivonen J, Lahteenmaki PL. Postabortal contraception with norethisterone enanthate injections. Contraception 1983;27:553–62.
97. Ortayli N, Bulut A, Sahin T, Sivin I. Immediate postabortal contraception with the levonorgestrel intrauterine device, Norplant, and traditional methods. Contraception 2001;63:309–14.
98. Bonny AE, Ziegler J, Harvey R, et al. Weight gain in obese and nonobese adolescent girls initiating depot medroxyprogesterone, oral contraceptive pills, or no hormonal contraceptive method. Arch Pediatr Adolesc Med 2006;160:40–5.

99. Clark MK, Dillon JS, Sowers M, Nichols S. Weight, fat mass, and central distribution of fat increase when women use depot-medroxyprogesterone acetate for contraception. Int J Obes (Lond) 2005;29:1252–8.
100. Jain J, Jakimiuk AJ, Bode FR, Ross D, Kaunitz AM. Contraceptive efficacy and safety of DMPA-SC. Contraception 2004;70:269–75.
101. Kozlowski KJ, Rickert VI, Hendon A, Davis P. Adolescents and Norplant: preliminary findings of side effects. J Adolesc Health 1995;16:373–8.
102. Leiman G. Depo-medroxyprogesterone acetate as a contraceptive agent: its effect on weight and blood pressure. Am J Obstet Gynecol 1972;114:97–102.
103. Mangan SA, Larsen PG, Hudson S. Overweight teens at increased risk for weight gain while using depot medroxyprogesterone acetate. J Pediatr Adolesc Gynecol 2002;15:79–82.
104. Risser WL, Gefter LR, Barratt MS, Risser JM. Weight change in adolescents who used hormonal contraception. J Adolesc Health 1999;24:433–6.
105. Westhoff C, Jain JK, Milsom I, Ray A. Changes in weight with depot medroxyprogesterone acetate subcutaneous injection 104 mg/0.65 mL 1. Contraception 2007;75:261–7.
106. Weiss HG, Nehoda H, Labeck B, et al. Pregnancies after adjustable gastric banding. Obes Surg 2001;11:303–6.
107. Gerrits EG, Ceulemans R, van HR, Hendrickx L, Totte E. Contraceptive treatment after biliopancreatic diversion needs consensus. Obes Surg 2003;13:378–82.
108. Victor A, Odlind V, Kral JG. Oral contraceptive absorption and sex hormone binding globulins in obese women: effects of jejunoileal bypass. Gastroenterol Clin North Am 1987;16:483–91.
109. Andersen AN, Lebech PE, Sorensen TI, Borggaard B. Sex hormone levels and intestinal absorption of estradiol and D-norgestrel in women following bypass surgery for morbid obesity. Int J Obes 1982;6:91–6.
110. World Health Organization. Cardiovascular disease and use of oral and injectable progestogen-only contraceptives and combined injectable contraceptives. Results of an international, multicenter, case-control study. Contraception 1998;57:315–24.
111. Heinemann LA, Assmann A, DoMinh T, et al. Oral progestogen-only contraceptives and cardiovascular risk: results from the Transnational Study on Oral Contraceptives and the Health of Young Women. Eur J Contracept Reprod Health Care 1999;4:67–73.
112. Vasilakis C, Jick H, Mar Melero-Montes M. Risk of idiopathic venous thromboembolism in users of progestogens alone. Lancet 1999;354:1610–1.
113. Sonmezer M, Atabekoglu C, Cengiz B, et al. Depot-medroxyprogesterone acetate in anticoagulated patients with previous hemorrhagic corpus luteum. European J Contracept Reprod Health Care 2005;10:9–14.
114. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co; 1994.
115. Avila WS, Grinberg M, Melo NR, Aristodemo PJ, Pileggi F. Contraceptive use in women with heart disease [in Portuguese]. Arq Bras Cardiol 1996;66:205–11.
116. Taurelle R, Ruet C, Jaupart F, Magnier S. Contraception using a progestagen-only minipill in cardiac patients [in French]. Arch Mal Coeur Vaiss 1979;72:98–106.
117. Bernatsky S, Ramsey-Goldman R, Gordon C, et al. Factors associated with abnormal Pap results in systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1386–9.
118. Bernatsky S, Clarke A, Ramsey-Goldman R, et al. Hormonal exposures and breast cancer in a sample of women with systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1178–81.
119. Chopra N, Koren S, Greer WL, et al. Factor V Leiden, prothrombin gene mutation, and thrombosis risk in patients with antiphospholipid antibodies. J Rheumatol 2002;29:1683–8.
120. Esdaile JM, Abrahamowicz M, Grodzicky T, et al. Traditional Framingham risk factors fail to fully account for accelerated atherosclerosis in systemic lupus erythematosus. Arthritis Rheum 2001;44:2331–7.
121. Julkunen HA. Oral contraceptives in systemic lupus erythematosus: side-effects and influence on the activity of SLE. Scand J Rheumatol 1991;20:427–33.
122. Julkunen HA, Kaaja R, Friman C. Contraceptive practice in women with systemic lupus erythematosus. Br J Rheumatol 1993;32:227–30.
123. Jungers P, Dougados M, Pelissier C, et al. Influence of oral contraceptive therapy on the activity of systemic lupus erythematosus. Arthritis Rheum 1982;25:618–23.
124. Manzi S, Meilahn EN, Rairie JE, et al. Age-specific incidence rates of myocardial infarction and angina in women with systemic lupus erythematosus: comparison with the Framingham Study. Am J Epidemiol 1997;145:408–15.
125. McAlindon T, Giannotta L, Taub N, et al. Environmental factors predicting nephristis in systemic lupus erythematosus. Ann Rheum Dis 1993;52:720–4.
126. McDonald J, Stewart J, Urowitz MB, et al. Peripheral vascular disease in patients with systemic lupus erythematosus. Ann Rheum Dis 1992;51:56–60.
127. Mintz G, Gutierrez G, Deleze M, et al. Contraception with progestogens in systemic lupus erythematosus. Contraception 1984;30:29–38.
128. Petri M. Musculoskeletal complications of systemic lupus erythematosus in the Hopkins Lupus Cohort: an update. Arthritis Care Res 1995;8:137–45.
129. Petri M, Kim MY, Kalunian KC, et al. Combined oral contraceptives in women with systemic lupus erythematosus. N Engl J Med 2005;353:2550–8.
130. Petri M. Lupus in Baltimore: evidence-based 'clinical perarls' from the Hopkins Lupus Cohort. Lupus 2005;14:970–3.
131. Sanchez-Guerrero J, Uribe AG, Jimenez-Santana L, et al. A trial of contraceptive methods in women with systemic lupus erythematosus. N Engl J Med 2005;353:2539–49.
132. Sarabi ZS, Chang E, Bobba R, et al. Incidence rates of arterial and venous thrombosis after diagnosis of systemic lupus erythematosus. Arthritis Rheum 2005;53:609–12.
133. Schaedel ZE, Dolan G, Powell MC. The use of the levonorgestrel-releasing intrauterine system in the management of menorrhagia in women with hemostatic disorders. Am J Obstet Gynecol 2005;193:1361–3.
134. Somers E, Magder LS, Petri M. Antiphospholipid antibodies and incidence of venous thrombosis in a cohort of patients with systemic lupus erythematosus. J Rheumatol 2002;29:2531–6.
135. Urowitz MB, Bookman AA, Koehler BE, et al. The bimodal mortality pattern of systemic lupus erythematosus. Am J Med 1976;60:221–5.
136. Choojitarom K, Verasertniyom O, Totemchokchyakarn K, et al. Lupus nephritis and Raynaud's phenomenon are significant risk factors for vascular thrombosis in SLE patients with positive antiphospholipid antibodies. Clini Rheumatol 2008;27:345–51.
137. Wahl DG, Guillemin F, de Maistre E, et al. Risk for venous thrombosis related to antiphospholipid antibodies in systemic lupus erythematosus—a meta-analysis. Lupus 1997;6:467–73.

138. Demers R, Blais JA, Pretty H. Rheumatoid arthritis treated by norethynodrel associated with mestranol: clinical aspects and laboratory tests [in French]. Can Med Assoc J 1966;95:350–4.
139. Drossaers-Bakker KW, Zwinderman AH, Van ZD, Breedveld FC, Hazes JM. Pregnancy and oral contraceptive use do not significantly influence outcome in long term rheumatoid arthritis. Ann Rheum Dis 2002;61:405–8.
140. Gilbert M, Rotstein J, Cunningham C, et al. Norethynodrel with mestranol in treatment of rheumatoid arthritis. JAMA 1964;190:235.
141. Gill D. Rheumatic complaints of women using anti-ovulatory drugs. An evaluation. J Chronic Dis 1968;21:435–44.
142. Hazes JM, Dijkmans BA, Vandenbroucke JP, Cats A. Oral contraceptive treatment for rheumatoid arthritis: an open study in 10 female patients. Br J Rheumatol 1989;28 Suppl 1:28–30.
143. Ostensen M, Aune B, Husby G. Effect of pregnancy and hormonal changes on the activity of rheumatoid arthritis. Scand J Rheumatol 1983;12:69–72.
144. Vignos PJ, Dorfman RI. Effect of large doses of progesterone in rheumatoid arthritis. Am J Med Sci 1951;222:29–34.
145. Bijlsma JW, Huber-Bruning O, Thijssen JH. Effect of oestrogen treatment on clinical and laboratory manifestations of rheumatoid arthritis. Ann Rheum Dis 1987;46:777–9.
146. Cromer BA, Smith RD, Blair JM, Dwyer J, Brown RT. A prospective study of adolescents who choose among levonorgestrel implant (Norplant), medroxyprogesterone acetate (Depo-Provera), or the combined oral contraceptive pill as contraception. Pediatrics 1994;94 :687–94.
147. Gupta N, O'Brien R, Jacobsen LJ, et al. Mood changes in adolescents using depo-medroxyprogesterone acetate for contraception: a prospective study. Am J Obstet Gynecol 2001;14:71–6.
148. Westoff C, Truman C. Depressive symptoms and Depo-Provera. Contraception 1998;57:237–40.
149. Westoff C, Truman C, Kalmuss D, et al. Depressive symptoms and Norplant contraceptive implants. Contraception 1998;57:241–5.
150. Smith JS. Cervical cancer and use of hormonal conraceptives: a systematic review. Lancet 2003;361:1159–67.
151. Baeten JM, Nyange PM, Richardson BA, et al. Hormonal contraception and risk of sexually transmitted disease acquisition: results from a prospective study. Am J Obstet Gynecol 2001;185:380–5.
152. Giuliano AR, Papenfuss M, Abrahamsen M, et al. Human papillomavirus infection at the United States–Mexico border: implications for cervical cancer prevention and control. Cancer Epidemiol Biomarkers Prev 2001;10:1129–36.
153. Jacobson DL, Peralta L, Farmer M, et al. Relationship of hormonal contraception and cervical ectopy as measured by computerized planimetry to chlamydial infection in adolescents. Sex Transm Dis 2000;27:313–9.
154. Lavreys L, Chohan B, Ashley R, et al. Human herpesvirus 8: seroprevalence and correlates in prostitutes in Mombasa, Kenya. J Infect Dis 2003;187:359–63.
155. Morrison CS, Bright P, Wong EL, et al. Hormonal contraceptive use, cervical ectopy, and the acquisition of cervical infections. Sex Transm Dis 2004;31:561–7.
156. Moscicki AB, Hills N, Shiboski S, et al. Risks for incident human papillomavirus infection and low-grade squamous intraepithelial lesion development in young females. JAMA 2001;285:2995–3002.
157. Nsofor BI, Bello CS, Ekwempu CC. Sexually transmitted disease among women attending a family planning clinic in Zaria, Nigeria. Int J Gynaecol Obstet 1989;28:365–7.
158. Ruijs GJ, Kauer FM, van Gijssel PM, Schirm J, Schroder FP. Direct immunofluorescence for *Chlamydia trachomatis* on urogenital smears for epidemiological purposes. Eur J Obstet Gyneco Reprod Biol 1988;27:289–97.
159. Aklilu M, Messele T, Tsegaye A, et al. Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia. AIDS 2001;15:87–96.
160. Allen S, Serufilira A, Gruber V, et al. Pregnancy and contraception use among urban Rwandan women after HIV testing and counseling. Am J Public Health 1993;83:705–10.
161. Baeten JM, Benki S, Chohan V, et al. Hormonal contraceptive use, herpes simplex virus infection, and risk of HIV-1 acquisition among Kenyan women. AIDS 2007;21:1771–7.
162. Bulterys M, Chao A, Habimana P, et al. Incident HIV-1 infection in a cohort of young women in Butare, Rwanda. AIDS 1994;8:1585–91.
163. Carael M, Van de Perre PH, Lepage PH, et al. Human immunodeficiency virus transmission among heterosexual couples in Central Africa. AIDS 1988;2:201–5.
164. Cohen CR, Duerr A, Pruithithada N, et al. Bacterial vaginosis and HIV seroprevalence among female commercial sex workers in Chiang Mai, Thailand. AIDS 1995;9:1093–7.
165. Criniti A, Mwachari CW, Meier AS, et al. Association of hormonal contraception and HIV-seroprevalence in Nairobi, Kenya. AIDS 2003;17:2667–9.
166. Kapiga SH, Shao JF, Lwihula GK, Hunter DJ. Risk factors for HIV infection among women in Dar-es-Salaam, Tanzania. J Acquir Immune Defic Syndr 1994;7:301–9.
167. Kapiga SH, Lyamuya EF, Lwihula GK, Hunter DJ. The incidence of HIV infection among women using family planning methods in Dar es Salaam, Tanzania. AIDS 1998;12:75–84.
168. Kiddugavu M, Makumbi F, Wawer MJ, et al. Hormonal contraceptive use and HIV-1 infection in a population-based cohort in Rakai, Uganda. AIDS 2003;17:233–40.
169. Kilmarx PH, Limpakarnjanarat K, Mastro TD, et al. HIV-1 seroconversion in a prospective study of female sex workers in northern Thailand: continued high incidence among brothel-based women. AIDS 1998;12:1889–98.
170. Kleinschmidt I, Rees H, Delany S, et al. Injectable progestin contraceptive use and risk of HIV infection in a South African family planning cohort. Contraception 2007;75:461–7.
171. Lavreys L, Chohan V, Overbaugh J, et al. Hormonal contraception and risk of cervical infections among HIV-1-seropositive Kenyan women. AIDS 2004;18:2179–84.
172. Limpakarnjanarat K, Mastro TD, Saisorn S, et al. HIV-1 and other sexually transmitted infections in a cohort of female sex workers in Chiang Rai, Thailand. Sex Transm Infect 1999;75:30–5.
173. Martin HL, Jr., Nyange PM, Richardson BA, et al. Hormonal contraception, sexually transmitted diseases, and risk of heterosexual transmission of human immunodeficiency virus type 1. J Infect Dis 1998;178:1053–9.
174. Mati JK, Hunter DJ, Maggwa BN, Tukei PM. Contraceptive use and the risk of HIV infection in Nairobi, Kenya. Int J Gynaecol Obstet 1995;48:61–7.
175. Morrison CS, Richardson BA, Mmiro F, et al. Hormonal contraception and the risk of HIV acquisition. AIDS 2007;21:85–95.
176. Myer L, Denny L, Wright TC, Kuhn L. Prospective study of hormonal contraception and women's risk of HIV infection in South Africa. Int J Epidemiol 2007;36:166–74.

177. Nagachinta T, Duerr A, Suriyanon V, et al. Risk factors for HIV-1 transmission from HIV-seropositive male blood donors to their regular female partners in northern Thailand. AIDS 1997;11:1765–72.
178. Nzila N, Laga M, Thiam MA, et al. HIV and other sexually transmitted diseases among female prostitutes in Kinshasa. AIDS 1991;5:715–21.
179. Plourde PJ, Plummer FA, Pepin J, et al. Human immunodeficiency virus type 1 infection in women attending a sexually transmitted diseases clinic in Kenya [comment]. J Infect Dis 1992;166:86–92.
180. Rehle T, Brinkmann UK, Siraprapasiri T, et al. Risk factors of HIV-1 infection among female prostitutes in Khon Kaen, northeast Thailand. Infection 1992;20:328–31.
181. Siraprapasiri T, Thanprasertsuk S, Rodklay A, et al. Risk factors for HIV among prostitutes in Chiangmai, Thailand. AIDS 1991;5:579–82.
182. Taneepanichskul S, Phuapradit W, Chaturachinda K. Association of contraceptives and HIV-1 infection in Thai female commercial sex workers. Aust N Z J Obstet Gynaecol 1997;37:86–8.
183. Ungchusak K, Rehle T, Thammapornpilap P, et al. Determinants of HIV infection among female commercial sex workers in northeastern Thailand: results from a longitudinal study. J Acquir Immune Defic Syndr Hum Retrovirol 1996;12:500–7. Erratum in: J Acquir Immune Defic Syndr Hum Retrovirol 1998;18:192.
184. Allen S, Stephenson R, Weiss H, et al. Pregnancy, hormonal contraceptive use, and HIV-related death in Rwanda. J Womens Health (Larchmt) 2007;16:1017–27.
185. Cejtin HE, Jacobson L, Springer G, et al. Effect of hormonal contraceptive use on plasma HIV-1-RNA levels among HIV-infected women. AIDS 2003;17:1702–4.
186. Clark RA, Kissinger P, Williams T. Contraceptive and sexually transmitted diseases protection among adult and adolescent women infected with human immunodeficiency virus. Int J STD AIDS 1996;7:439–42.
187. Clark RA, Theall KP, Amedee AM, et al. Lack of association between genital tract HIV-1 RNA shedding and hormonal contraceptive use in a cohort of Louisiana women. Sex Transm Dis 2007;34:870–2.
188. Clemetson DB, Moss GB, Willerford DM, et al. Detection of HIV DNA in cervical and vaginal secretions. Prevalence and correlates among women in Nairobi, Kenya. JAMA 1993;269:2860–4.
189. European Study Group on Heterosexual Transmission of HIV. Comparison of female to male and male to female transmission of HIV in 563 stable couples. BMJ 1992;304:809–13.
190. Kaul R, Kimani J, Nagelkerke NJ, et al. Risk factors for genital ulcerations in Kenyan sex workers. The role of human immunodeficiency virus type 1 infection. Sex Transm Dis 1997;24:387–92.
191. Kilmarx PH, Limpakarnjanarat K, Kaewkungwal J, et al. Disease progression and survival with human immunodeficiency virus type 1 subtype E infection among female sex workers in Thailand. J Infect Dis 2000;181:1598–606.
192. Kovacs A, Wasserman SS, Burns D, et al. Determinants of HIV-1 shedding in the genital tract of women. Lancet 2001;358:1593–601.
193. Kreiss J, Willerford DM, Hensel M, et al. Association between cervical inflammation and cervical shedding of human immunodeficiency virus DNA. J Infect Dis 1994;170:1597-601.
194. Mostad SB, Overbaugh J, DeVange DM, et al. Hormonal contraception, vitamin A deficiency, and other risk factors for shedding of HIV-1 infected cells from the cervix and vagina. Lancet 1997;350:922–7.
195. Richardson BA, Otieno PA, Mbori-Ngacha D, et al. Hormonal contraception and HIV-1 disease progression among postpartum Kenyan women. AIDS 2007;21:749–53.
196. Seck K, Samb N, Tempesta S, et al. Prevalence and risk factors of cervicovaginal HIV shedding among HIV-1 and HIV-2 infected women in Dakar, Senegal. Sex Transm Infect 2001;77:190–3.
197. Stringer EM, Kaseba C, Levy J, et al. A randomized trial of the intrauterine contraceptive device vs hormonal contraception in women who are infected with the human immunodeficiency virus. Am J Obstet Gynecol 2007;197:144–8.
198. Taneepanichskul S, Intaraprasert S, Phuapradit W, Chaturachinda K. Use of Norplant implants in asymptomatic HIV-1 infected women. Contraception 1997;55:205–7.
199. Taneepanichskul S, Tanprasertkul C. Use of Norplant implants in the immediate postpartum period among asymptomatic HIV-1-positive mothers. Contraception 2001;64:39–41.
200. Wang CC, McClelland RS, Overbaugh J, et al. The effect of hormonal contraception on genital tract shedding of HIV-1. AIDS 2004;18:205–9.
201. Tagy AH, Saker ME, Moussa AA, Kolgah A. The effect of low-dose combined oral contraceptive pills versus injectable contracetpive (Depot Provera) on liver function tests of women with compensated bilharzial liver fibrosis. Contraception 2001;64:173–6.
202. Pyorala T, Vahapassi J, Huhtala M. The effect of lynestrenol and norethindrone on the carbohydrate and lipid metabolism in subjects with gestational diabetes. Ann Chir Gynaecol 1979;68:69–74.
203. Radberg T, Gustafson A, Skryten A, Karlsson K. Metabolic studies in women with previous gestational diabetes during contraceptive treatment: effects on serum lipids and high density lipoproteins. Acta Endocrinol (Copenh) 1982;101:134–9.
204. Xiang AH, Kawakubo M, Kjos SL, Buchanan TA. Long-acting injectable progestin contraception and risk of type 2 diabetes in Latino women with prior gestational diabetes mellitus. Diabetes Care 2006;29:613–7.
205. Xiang AH, Kawakubo M, Buchanan TA, Kjos SL. A longitudinal study of lipids and blood pressure in relation to method of contraception in Latino women with prior gestational diabetes mellitus. Diabetes Care 2007;30:1952–8.
206. Kjos SL, Peters RK, Xiang A, et al. Contraception and the risk of type 2 diabetes mellitus in Latina women with prior gestational diabetes mellitus. JAMA 1998;280:533–8.
207. Nelson AL, Le MH, Musherraf Z, Vanberckelaer A. Intermediate-term glucose tolerance in women with a history of gestational diabetes: natural history and potential associations with breastfeeding and contraception. Am J Obstet Gynecol 2008;198:699–7.
208. Diab KM, Zaki MM. Contraception in diabetic women: comparative metabolic study of norplant, depot medroxyprogesterone acetate, low dose oral contraceptive pill and CuT380A. J Obstet Gynecol Res 2000;26:17–26.
209. Lunt H, Brown LJ. Self-reported changes in capillary glucose and insulin requirements during the menstrual cycle. Diabetic Med 1995;13:525–30.
210. Radberg T, Gustafson A, Skryten A, Karlsson K. Oral contraception in diabetic women. A cross-over study on seum and high density lipoprotein (HDL) lipids and diabetes control during progestogen and combined estrogen/progestogen contraception. Horm Metab Res 1982;14:61–5.
211. Skouby SO, Molsted-Petersen L, Kuhl C, Bennet P. Oral contraceptives in diabetic womne: metabolic effects of four compounds with different estrogen/progestogen profiles. Fertil Steril 1986;46:858–64.

212. Bitton A, Peppercorn MA, Antonioli DA, et al. Clinical, biological, and histologic parameters as predictors of relapse in ulcerative colitis. Gastroenterology 2001;120:13–20.
213. Cosnes J, Carbonnel F, Carrat F, Beaugerie L, Gendre JP. Oral contraceptive use and the clinical course of Crohn's disease: a prospective cohort study. Gut 1999;45:218–22.
214. Sutherland LR, Ramcharan S, Bryant H, Fick G. Effect of oral contraceptive use on reoperation following surgery for Crohn's disease. Dig Dis Sci 1992;37:1377–82.
215. Timmer A, Sutherland LR, Martin F. Oral contraceptive use and smoking are risk factors for relapse in Crohn's disease. The Canadian Mesalamine for Remission of Crohn's Disease Study Group. Gastroenterology 1998;114:1143–50.
216. Wright JP. Factors influencing first relapse in patients with Crohn's disease. J Clin Gastroenterol 1992;15:12–6.
217. D'halluin V, Vilgrain V, Pelletier G, et al. Natural history of focal nodular hyperplasia. A retrospective study of 44 cases [in French]. Gastroenterol Clin Biol 2001;25:1008–10.
218. Mathieu D, Kobeiter H, Maison P, et al. Oral contraceptive use and focal nodular hyperplasia of the liver. Gastroenterology 2000;118:560–4.
219. Adadevoh BK, Isaacs WA. The effect of megestrol acetate on sickling. Am J Med Sci 1973;265:367–70.
220. Barbosa IC, Ladipo OA, Nascimento ML, et al. Carbohydrate metabolism in sickle cell patients using subdermal implant containing nomegesterol acetate (Uniplant). Contraception 2001;63:263–5.
221. de Abood M, de Castillo Z, Guerrero F, Espino M, Austin KL. Effects of Depo-Provera or Microgynon on the painful crises of sickle cell anemia patients. Contraception 1997;56:313–6.
222. De Ceulaer K, Gruber C, Hayes R, Serjeant GR. Medroxyprogesterone acetate and homozygous sickle-cell disease. Lancet 1982;2:229–31.
223. Howard RJ, Lillis C, Tuck SM. Contraceptives, counseling, and pregnancy in women with sickle cell disease. BMJ 1993;306:1735–7.
224. Ladipo OA, Falusi AG, Feldblum PJ, Osotimehin BO, Otolorin EO, Ojengbede OA Norplant use by women with sickle cell disease. Int J Gynaecol Obstet 1993;41:85–7.
225. Nascimento ML, Ladipo OA, Coutinho E. Nomogestrol acetate contraceptive implant use by women with sickle cell disease. Clin Pharmacol Ther 1998;64:433–8.
226. Yoong WC, Tuck SM, Yardumian A. Red cell deformability in oral contraceptive pill users with sickle cell anaemia. Br J Haematol 1999;104:868–70.
227. Odlind V, Olsson S-E. Enhanced metabolism of levonorgestrel during phenytoin treatment in a woman with Norplant implants. Contraception 1986;33:257–61.
228. Schindlbeck C, Janni W, Friese K. Failure of Implanon contraception in a patient taking carbamazepine for epilepsia. Arch Gynecol Obstet 2006;273:255–6.
229. Shane-McWhorter L, Cerven JD, MacFarlane LL, Osborn C. Enhanced metabolism of levonorgestrel during phenobarbital treatment and resultant pregnancy. Pharmacotherapy 1998;18:1360–4.
230. Reimers A, Helde G, Brodtkorb E. Ethinyl estradiol, not progestogens, reduces lamotrigine serum concentrations. Epilepsia 2005;46:1414–7.

Appendix D

Classifications for Emergency Contraceptive Pills

Classifications for emergency contraceptive pills (ECPs) are for both levonorgestrel and combined oral contraceptive pills. ECPs do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

BOX. Categories for Classifying Emergency Contraceptive Pills

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for emergency contraceptive pills, including levonorgestrel contraceptive pills and combined oral contraceptive pills*†

Condition	Category	Clarifications/Evidence/Comments
Personal Characteristics and Reproductive History		
Pregnancy	Not applicable	**Clarification:** Although this method is not indicated for a woman with a known or suspected pregnancy, no harm to the woman, the course of her pregnancy, or the fetus if ECPs are inadvertently used is known to exist.
Breastfeeding	1	
Past ectopic pregnancy	1	
History of bariatric surgery§		
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	1	**Comment:** Bariatric surgical procedures involving a malabsorptive component have the potential to decrease oral contraceptive effectiveness, perhaps further decreased by postoperative complications such as long-term diarrhea and/or vomiting. Because of these malabsorptive concerns, an emergency IUD might be more appropriate than ECPs.
Cardiovascular Disease		
History of severe cardiovascular complications§ (ischemic heart disease, cerebrovascular attack, or other thromboembolic conditions)	2	**Comment:** The duration of ECP use is less than that of regular use of COCs or POPs and thus would be expected to have less clinical impact.
Angina pectoris	2	**Comment:** The duration of ECP use is less than that of regular use of COCs or POPs and thus would be expected to have less clinical impact.
Rheumatic Diseases		
Rheumatoid arthritis		
a. On immunosuppressive therapy	1	
b. Not on immunosuppressive therapy	1	
Neurologic Conditions		
Migraine	2	**Comment:** The duration of ECP use is less than that of regular use of COCs or POPs and thus would be expected to have less clinical impact.
Gastrointestinal Conditions		
Inflammatory bowel disease (ulcerative colitis, Crohn disease)	1	
Severe liver disease§ (including jaundice)	2	**Comment:** The duration of ECP use is less than that of regular use of COCs or POPs and thus would be expected to have less clinical impact.
Solid Organ Transplantation		
Solid organ transplantation§		
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	1	
b. Uncomplicated	1	

TABLE. (*Continued*) Classifications for emergency contraceptive pills, including levonorgestrel contraceptive pills and combined oral contraceptive pills*†

Condition	Category	Clarifications/Evidence/Comments
Other		
Repeated ECP use	1	**Clarification:** Recurrent ECP use is an indication that the woman requires further counseling about other contraceptive options. Frequently repeated ECP use may be harmful for women with conditions classified as 2, 3, or 4 for CHC or POC use.
Rape	1	**Comment:** Use of ECPs in cases of rape has no restrictions.

* Abbreviations: STI = sexually transmitted infection; HIV = human immunodeficiency virus; ECP, emergency contraceptive pill; IUD = intrauterine device; COC = combined oral contraceptive; POP = progestin-only pill; CHC = combined hormonal contraceptive; POC = progestin-only contraceptive

† ECPs do not protect against STI/HIV. If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

Appendix E

Classifications for Intrauterine Devices

Classifications for intrauterine devices (IUDs) are for the levonorgestrel-releasing (20 μg/24 hours) IUD and the copper-bearing IUD (Box). IUDs do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

BOX. Categories for Classifying Intrauterine Devices

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for intrauterine devices, including the LNG-IUD and the Cu-IUD*†

Condition	Category		Clarifications/Evidence/Comments
	LNG-IUD	Cu-IUD	
Personal Characteristics and Reproductive History			
Pregnancy	4	4	**Clarification:** The IUD is not indicated during pregnancy and should not be used because of the risk for serious pelvic infection and septic spontaneous abortion.
Age			
a. Menarche to <20 yrs	2	2	**Comment:** Concern exists about both the risk for expulsion from nulliparity and for STIs from sexual behaviour in younger age groups.
b. ≥20 yrs	1	1	
Parity			
a. Nulliparous	2	2	**Evidence:** Data conflict about whether IUD use is associated with infertility among nulliparous women, although well-conducted studies suggest no increased risk (*1–9*).
b Parous	1	1	
Postpartum (breastfeeding or nonbreastfeeding women, including post-Cesarean section)			
a. <10 minutes after delivery of the placenta	2	1	**Evidence:** Immediate postpartum Cu-IUD insertion, particularly when insertion occurs immediately after delivery of the placenta, is associated with lower expulsion rates than is delayed postpartum insertion up to 72 hours postpartum; no data exist that examine times >72 hours postpartum. In addition, postplacental placement at the time of Cesarean section has lower expulsion rates than does postplacental vaginal insertions. Insertion complications of perforation and infection are not increased by Cu-IUD placement at any time during the postpartum period (*10–23*). No evidence is available that compares different insertion times for the LNG-IUD.
b. 10 minutes after delivery of the placenta to <4 wks	2	2	
c. ≥4 wks	1	1	
d. Puerperal sepsis	4	4	**Comment:** Insertion of an IUD might substantially worsen the condition.
Postabortion			
a. First trimester	1	1	**Clarification:** IUDs can be inserted immediately after first trimester spontaneous or induced abortion.
b. Second trimester	2	2	**Evidence:** Risk for complications from immediate versus delayed insertion of an IUD after abortion did not differ. Expulsion was greater when an IUD was inserted after a second trimester abortion than when inserted after a first trimester abortion. Safety or expulsion for postabortion insertion of an LNG-IUD did not differ from that of a Cu-IUD (*24–37*).
c. Immediate postseptic abortion	4	4	**Comment:** Insertion of an IUD might substantially worsen the condition.

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category		Clarifications/Evidence/Comments
	LNG-IUD	Cu-IUD	
Past ectopic pregnancy	1	1	**Comment:** The absolute risk for ectopic pregnancy is extremely low because of the high effectiveness of IUDs. However, when a woman becomes pregnant during IUD use, the relative likelihood of ectopic pregnancy increases greatly.
History of pelvic surgery (see Postpartum, including post-Cesarean section)	1	1	
Smoking			
a. Age <35 yrs	1	1	
b. Age ≥35 yrs			
i. <15 Cigarettes/day	1	1	
ii. ≥15 Cigarettes/day	1	1	
Obesity			
a. ≥30 kg/m^2 BMI	1	1	
b. Menarche to <18 yrs and ≥30 kg/m^2 BMI	1	1	
History of bariatric surgery§			
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	1	
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	1	1	
Cardiovascular Disease			
Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, and hypertension)	2	1	
Hypertension			
For all categories of hypertension, classifications are based on the assumption that no other risk factors for cardiovascular disease exist. When multiple risk factors do exist, risk for cardiovascular disease might increase substantially. A single reading of blood pressure level is not sufficient to classify a woman as hypertensive.			
a. Adequately controlled hypertension	1	1	
b. Elevated blood pressure levels (properly taken measurements)			
i. Systolic 140–159 mm Hg or diastolic 90–99 mm Hg	1	1	
ii. Systolic ≥160 mm Hg or diastolic ≥100 mm Hg§	2	1	**Comment:** Theoretical concern exists about the effect of LNG on lipids. Use of Cu-IUDs has no restrictions.
c. Vascular disease	2	1	**Comment:** Theoretical concern exists about the effect of LNG on lipids. Use of Cu-IUDs has no restrictions.
History of high blood pressure during pregnancy (where current blood pressure is measurable and normal)	1	1	
Deep venous thrombosis (DVT)/ pulmonary embolism (PE)			
a. History of DVT/PE, not on anticoagulant therapy			
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	2	1	
• History of estrogen-associated DVT/PE			
• Pregnancy-associated DVT/PE			
• Idiopathic DVT/PE			
• Known thrombophilia, including antiphospholipid syndrome			
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer			
• History of recurrent DVT/PE			
ii. Lower risk for recurrent DVT/PE (no risk factors)	2	1	

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category: LNG-IUD	Category: Cu-IUD	Clarifications/Evidence/Comments
b. Acute DVT/PE	2	2	**Evidence:** No direct evidence exists on the use of POCs among women with acute DVT/PE. Although findings on the risk for venous thrombosis with the use of POCs in otherwise healthy women are inconsistent, any small increased risk is substantially less than that with COCs (*38–40*).
c. DVT/PE and established on anticoagulant therapy for at least 3 mos			**Evidence:** No direct evidence exists on the use of POCs among women with acute DVT/PE. Although findings on the risk for venous thrombosis with the use of POCs in otherwise healthy women are inconsistent, any small increased risk is substantially less than that with COCs (*38–40*). **Evidence:** Limited evidence indicates that insertion of the LNG-IUD does not pose major bleeding risks in women on chronic anticoagulant therapy. (*41–44*) **Comment:** The LNG-IUD might be a useful treatment for menorrhagia in women on long-term chronic anticoagulation therapy.
i. Higher risk for recurrent DVT/PE (≥1 risk factors) • Known thrombophilia, including antiphospholipid syndrome • Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding nonmelanoma skin cancer • History of recurrent DVT/PE	2	2	
ii. Lower risk for recurrent DVT/PE (no risk factors)	2	2	
d. Family history (first-degree relatives)	1	1	
e. Major surgery			
i. With prolonged immobilization	2	1	
ii. Without prolonged immobilization	1	1	
f. Minor surgery without immobilization	1	1	
Known thrombogenic mutations§ (e.g., factor V Leiden; prothrombin mutation; protein S, protein C, and antithrombin deficiencies)	2	1	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening.
Superficial venous thrombosis			
a. Varicose veins	1	1	
b. Superficial thrombophlebitis	1	1	
Current and history of ischemic heart disease§	Initiation: 2 / Continuation: 3	1	**Comment:** Theoretical concern exists about the effect of LNG on lipids. Use of Cu-IUDs has no restrictions.
Stroke§ (history of cerebrovascular accident)	2	1	**Comment:** Theoretical concern exists about the effect of LNG on lipids. Use of Cu-IUDs has no restrictions.
Known hyperlipidemias	2	1	**Clarification:** Routine screening is not appropriate because of the rarity of the condition and the high cost of screening.
Valvular heart disease			
a. Uncomplicated	1	1	**Comment**: According to the American Heart Association, administration of prophylactic antibiotics solely to prevent endocarditis is not recommended for patients who undergo genitourinary tract procedures, including insertion or removal of IUDs (*45*).
b. Complicated§ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)	1	1	**Comment**: According to the American Heart Association, administration of prophylactic antibiotics solely to prevent endocarditis is not recommended for patients who undergo genitourinary tract procedures, including insertion or removal of IUDs *(45)*.
Peripartum cardiomyopathy§			
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (*46*)			**Evidence:** No direct evidence exists on the safety of IUDs among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies did not demonstrate any cases of arrhythmia or infective endocarditis in women with cardiac disease who used IUDs (*47,48*).
i. <6 mos	2	2	**Comment:** IUD insertion might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.
ii. ≥6 mos	2	2	

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category: LNG-IUD	Category: Cu-IUD	Clarifications/Evidence/Comments
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (*46*)	2	2	**Evidence:** There is no direct evidence on the safety of IUDs among women with peripartum cardiomyopathy. Limited indirect evidence from noncomparative studies did not demonstrate any cases of arrhythmia or infective endocarditis in women with cardiac disease who used IUDs (*47,48*). **Comment:** IUD insertion might induce cardiac arrhythmias in healthy women; women with peripartum cardiomyopathy have a high incidence of cardiac arrhythmias.
Rheumatic Diseases			
Systemic lupus erythematosus (SLE)§ Persons with SLE are at increased risk for ischemic heart disease, stroke, and VTE. Categories assigned to such conditions in the MEC should be the same for women with SLE who have these conditions. For all categories of SLE, classifications are based on the assumption that no other risk factors for cardiovascular disease are present; these classifications must be modified in the presence of such risk factors. Many women with SLE can be considered good candidates for most contraceptive methods, including hormonal contraceptives (*43,49–66*).			
		Initiation / Continuation	
a. Positive (or unknown) antiphospholipid antibodies	3	1 / 1	**Evidence:** Antiphospholipid antibodies are associated with a higher risk for both arterial and venous thrombosis (*67,68*).
b. Severe thrombocytopenia	2	3 / 2	**Clarification:** Severe thrombocytopenia increases the risk for bleeding. The category should be assessed according to the severity of thrombocytopenia and its clinical manifestations. In women with very severe thrombocytopenia who are at risk for spontaneous bleeding, consultation with a specialist and certain pretreatments might be warranted. **Evidence:** The LNG-IUD might be a useful treatment for menorrhagia in women with severe thrombocytopenia (*43*).
c. Immunosuppressive treatment	2	2 / 1	
d. None of the above	2	1 / 1	
Rheumatoid arthritis	Initiation / Continuation	Initiation / Continuation	
a. On immunosuppressive therapy	2 / 1	2 / 1	
b. Not on immunosuppressive therapy	1	1	
Neurologic Conditions			
Headaches	Initiation / Continuation		**Clarification:** Any new headaches or marked changes in headaches should be evaluated.
a. Non-migrainous (mild or severe)	1 / 1	1	
b. Migraine			
i. Without aura			**Comment:** Aura is a specific focal neurologic symptom. For more information about this and other diagnostic criteria, see: Headache Classification Subcommittee of the International Headache Society. The international classification of headache disorders. 2nd ed. Cephalalgia 2004;24(Suppl 1):1– 150. Available from http://www.i-h-s.org/upload/ct_clas/ihc_II_main_no_print.pdf.
• Age <35 yrs	2 / 2	1	
• Age ≥35 yrs	2 / 2	1	
ii. With aura, at any age	2 / 3	1	
Epilepsy§	1	1	
Depressive Disorders			
Depressive disorders	1	1	**Clarification**: The classification is based on data for women with selected depressive disorders. No data were available on bipolar disorder or postpartum depression. Drug interactions potentially can occur between certain antidepressant medications and hormonal contraceptives.
Reproductive Tract Infections and Disorders			
Vaginal bleeding patterns	Initiation / Continuation		
a. Irregular pattern without heavy bleeding	1 / 1	1	
b. Heavy or prolonged bleeding (includes regular and irregular patterns)	1 / 2	2	**Clarification:** Unusually heavy bleeding should raise suspicion of a serious underlying condition. **Evidence:** Evidence from studies examining the treatment effects of the LNG-IUD among women with heavy or prolonged bleeding reported no increase in adverse effects and found the LNG-IUD to be beneficial in treating menorrhagia (*69–76*).
Unexplained vaginal bleeding (suspicion for serious condition)	Initiation / Continuation	Initiation / Continuation	**Clarification:** If pregnancy or an underlying pathological condition (such as pelvic malignancy) is suspected, it must be evaluated and the category adjusted after evaluation. The IUD does not need to be removed before evaluation.
Before evaluation	4 / 2	4 / 2	

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category				Clarifications/Evidence/Comments
	LNG-IUD		Cu-IUD		
Endometriosis	1		2		**Evidence:** LNG-IUD use among women with endometriosis decreased dysmenorrhea, pelvic pain, and dyspareunia (*77–81*).
Benign ovarian tumors (including cysts)	1		1		
Severe dysmenorrhea	1		2		**Comment:** Dysmenorrhea might intensify with Cu-IUD use. LNG-IUD use has been associated with reduction of dysmenorrhea.
Gestational trophoblastic disease					
a. Decreasing or undetectable β–hCG levels	3		3		**Evidence:** Limited evidence suggests that women using an IUD after uterine evacuation for a molar pregnancy are not at greater risk for postmolar trophoblastic disease than are women using other methods of contraception (*82–84*).
b. Persistently elevated β-hCG levels or malignant disease§	4		4		**Evidence:** Limited evidence suggests that women using an IUD after uterine evacuation for a molar pregnancy are not at greater risk for postmolar trophoblastic disease than are women using other methods of contraception (*82–84*)
Cervical ectropion	1		1		
Cervical intraepithelial neoplasia	2		1		**Comment:** Theoretical concern exists that LNG-IUDs might enhance progression of cervical intraepithelial neoplasia.
Cervical cancer (awaiting treatment)	Initiation 4	Continuation 2	Initiation 4	Continuation 2	**Comment:** Concern exists about the increased risk for infection and bleeding at insertion. The IUD most likely will need to be removed at the time of treatment, but until then, the woman is at risk for pregnancy.
Breast disease					
a. Undiagnosed mass	2		1		
b. Benign breast disease	1		1		
c. Family history of cancer	1		1		
d. Breast cancer§					**Comment:** Breast cancer is a hormonally sensitive tumor. Concerns about progression of the disease might be less with LNG-IUDs than with COCs or higher-dose POCs.
i. Current	4		1		
ii. Past and no evidence of current disease for 5 yrs	3		1		
Endometrial hyperplasia	1		1		**Evidence:** Among women with endometrial hyperplasia, no adverse health events occurred with LNG-IUD use; most women experienced disease regression (*85–93*).
Endometrial cancer§	Initiation 4	Continuation 2	Initiation 4	Continuation 2	**Comment:** Concern exists about the increased risk for infection, perforation, and bleeding at insertion. The IUD most likely will need to be removed at the time of treatment, but until then, the woman is at risk for pregnancy.
Ovarian cancer§	1		1		**Comment:** Women with ovarian cancer who undergo fertility sparing treatment and need contraception may use an IUD.
Uterine fibroids	2		2		**Evidence:** Among women with uterine fibroids using an LNG-IUD, most experienced improvements in serum levels of hemoglobin, hematocrit, and ferritin (*73,94–100*) and menstrual blood loss (*73,75,94–101*). Rates of LNG-IUD expulsion were higher in women with uterine fibroids (11%) than in women without fibroids (0%–3%); these findings were not statistically significant or significance testing was not conducted (*75,101*). Rates of expulsion from noncomparative studies ranged from 0%–20% (*94,96–100*). **Comment:** Women with heavy or prolonged bleeding should be assigned the category for that condition.
Anatomical abnormalities					
a. Distorted uterine cavity (any congenital or acquired uterine abnormality distorting the uterine cavity in a manner that is incompatible with IUD insertion)	4		4		**Comment:** An anatomic abnormality that distorts the uterine cavity might preclude proper IUD placement.
b. Other abnormalities (including cervical stenosis or cervical lacerations) not distorting the uterine cavity or interfering with IUD insertion	2		2		

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category: LNG-IUD		Category: Cu-IUD		Clarifications/Evidence/Comments
Pelvic inflammatory disease (PID)	Initiation	Continuation	Initiation	Continuation	
a. Past PID (assuming no known current risk factors for STIs)					**Comment:** IUDs do not protect against STI/HIV/PID. In women at low risk for STIs, IUD insertion poses little risk for PID. Current risk for STIs and desire for future pregnancy are relevant considerations.
i. With subsequent pregnancy	1	1	1	1	
ii. Without subsequent pregnancy	2	2	2	2	
b. Current PID	4	2	4	2	**Clarification for continuation:** Treat the PID using appropriate antibiotics. The IUD usually does not need to be removed if the woman wishes to continue using it. Continued use of an IUD depends on the woman's informed choice and her current risk factors for STIs and PID. **Evidence:** Among IUD users treated for PID, clinical course did not differ regardless of whether the IUD was removed or left in place (*102–104*).
STIs	Initiation	Continuation	Initiation	Continuation	
a. Current purulent cervicitis or chlamydial infection or gonorrhea	4	2	4	2	**Clarification for continuation:** Treat the STI using appropriate antibiotics. The IUD usually does not need to be removed if the woman wishes to continue using it. Continued use of an IUD depends on the woman's informed choice and her current risk factors for STIs and PID. **Evidence:** No evidence exists about whether IUD insertion among women with STIs increases the risk for PID over that of women with no IUD insertion. Among women who had an IUD inserted, the absolute risk for subsequent PID was low among women with STI at the time of insertion but greater than among women with no STI at the time of IUD insertion (*105–111*).
b. Other STIs (excluding HIV and hepatitis)	2	2	2	2	
c. Vaginitis (including *Trichomonas vaginalis* and bacterial vaginosis)	2	2	2	2	
d. Increased risk for STIs	2/3	2	2/3	2	**Clarification for initiation**: If a woman has a very high individual likelihood of exposure to gonorrhea or chlamydial infection, the condition is a Category 3. **Evidence:** Using an algorithm to classify STI risk status among IUD users, 1 study reported that 11% of women at high risk for STIs experienced IUD-related complications compared with 5% of those not classified as high risk (*107*).
HIV/AIDS					
High risk for HIV	Initiation	Continuation	Initiation	Continuation	
	2	2	2	2	**Evidence:** Among women at risk for HIV, Cu-IUD use did not increase risk for HIV acquisition (*112–122*).
HIV infection§	2	2	2	2	**Evidence:** Among IUD users, limited evidence shows no higher risk for overall complications or for infectious complications in HIV-infected than in HIV-uninfected women. IUD use did not adversely affect progression of HIV when compared with hormonal contraceptive use among HIV-infected women. Furthermore, IUD use among HIV-infected women was not associated with increased risk for transmission to sex partners (*112,123–130*).
AIDS§	3	2	3	2	**Clarification for continuation:** IUD users with AIDS should be closely monitored for pelvic infection.
Clinically well on ARV therapy	2	2	2	2	
Other Infections					
Schistosomiasis					
a. Uncomplicated		1		1	
b. Fibrosis of the liver§ (if severe, see cirrhosis)		1		1	
Tuberculosis§	Initiation	Continuation	Initiation	Continuation	
a. Nonpelvic	1	1	1	1	
b. Pelvic	4	3	4	3	**Comment:** Insertion of an IUD may substantially worsen the condition.
Malaria		1		1	

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category LNG-IUD	Category Cu-IUD	Clarifications/Evidence/Comments
Endocrine Conditions			
Diabetes			
a. History of gestational disease	1	1	
b. Nonvascular disease			**Evidence:** Limited evidence on the use of the LNG-IUD among women with insulin-dependent or noninsulin-dependent diabetes suggests that these methods have little effect on short-term or long-term diabetes control (e.g., glycosylated hemoglobin levels), hemostatic markers, or lipid profile (*131,132*).
i. Noninsulin-dependent	2	1	
ii. Insulin-dependent§	2	1	
c. Nephropathy/retinopathy/neuropathy§	2	1	
d. Other vascular disease or diabetes of >20 yrs' duration§	2	1	
Thyroid disorders			
a. Simple goiter	1	1	
b. Hyperthyroid	1	1	
c. Hypothyroid	1	1	
Gastrointestinal Conditions			
Inflammatory bowel disease (IBD) (ulcerative colitis, Crohn disease)	1	1	**Evidence:** Although two case reports described three women with IBD who experienced exacerbation of disease 5 days–25 months after LNG-IUD insertion (*133,134*), no comparative studies have examined the safety of IUD use among women with IBD.
Gallbladder disease			
a. Symptomatic			
i. Treated by cholecystectomy	2	1	
ii. Medically treated	2	1	
iii. Current	2	1	
b. Asymptomatic	2	1	
History of cholestasis			
a. Pregnancy-related	1	1	
b. Past COC-related	2	1	**Comment:** Concern exists that history of COC-related cholestasis might predict subsequent cholestasis with LNG use. Whether risk exists with use of LNG-IUD is unclear.
Viral hepatitis			
a. Acute or flare	1	1	
b. Carrier	1	1	
c. Chronic	1	1	
Cirrhosis			
a. Mild (compensated)	1	1	
b. Severe§ (decompensated)	3	1	
Liver tumors			
a. Benign	2	1	
i. Focal nodular hyperplasia			
ii. Hepatocellular adenoma§	3	1	**Comment:** No evidence is available about hormonal contraceptive use in women with hepatocellular adenoma. COC use in healthy women is associated with development and growth of hepatocellular adenoma; whether other hormonal contraceptives have similar effects is not known.
b. Malignant§ (hepatoma)	3	1	
Anemias			
Thalassemia	1	2	**Comment:** Concern exists about an increased risk for blood loss with Cu-IUDs.
Sickle cell disease§	1	2	**Comment:** Concern exists about an increased risk for blood loss with Cu-IUDs.
Iron deficiency anemia	1	2	**Comment:** Concern exists about an increased risk for blood loss with Cu-IUDs.
Solid Organ Transplantation			
Solid organ transplantation§	Initiation / Continuation	Initiation / Continuation	**Evidence:** No comparative studies have examined IUD use among transplant patients. Four case reports of transplant patients using IUDs provided inconsistent results, including beneficial effects and contraceptive failures (*135–138*).
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	3 / 2	3 / 2	
b. Uncomplicated	2 / 2	2 / 2	

TABLE. (*Continued*) Classifications for intrauterine devices,*† including the LNG-IUD and the Cu-IUD

Condition	Category				Clarifications/Evidence/Comments
	LNG-IUD		Cu-IUD		
Drug Interactions					
Antiretroviral (ARV) therapy	Initiation	Continuation	Initiation	Continuation	**Clarification:** No known interaction exists between ARV therapy and IUD use. However, AIDS as a condition is classified as Category 3 for insertion and Category 2 for continuation unless the woman is clinically well on ARV therapy, in which case, both insertion and continuation are classified as Category 2 (see AIDS condition).
a. Nucleoside reverse transcriptase inhibitors (NRTIs)	2/3	2	2/3	2	
b. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	2/3	2	2/3	2	
c. Ritonavir-boosted protease inhibitors	2/3	2	2/3	2	
Anticonvulsant therapy					
a. Certain anticonvulsants (phenytoin, carbamazepine, barbiturates, primidone, topiramate, oxcarbazepine)		1		1	**Evidence:** Limited evidence suggests use of certain anticonvulsants does not interfere with the contraceptive effectiveness of the LNG-IUD (*139*).
b Lamotrigine		1		1	**Evidence:** No drug interactions have been reported among epileptic women taking lamotrigine and using the LNG-IUD (*140*).
Antimicrobial therapy					
a. Broad-spectrum antibiotics		1		1	
b. Antifungals		1		1	
c. Antiparasitics		1		1	
d. Rifampicin or rifabutin therapy		1		1	**Evidence:** One cross-sectional survey found that rifabutin had no impact on the effectiveness of the LNG-IUD (*139*).

* Abbreviations: LNG-IUD = levonorgestrel-releasing intrauterine device; Cu-IUD = copper IUD; STI = sexually transmitted infection; HIV = human immunodeficiency virus; BMI = body mass index; DVT = deep venous thrombosis; PE = pulmonary embolism; POC = progestin-only contraceptive; COC = combined oral contraceptive; SLE = systemic lupus erythematosus; MEC = Medical Eligibility Criteria; hCG = human chorionic gonadotropin; PID = pelvic inflammatory disease; AIDS = acquired immunodeficiency syndrome; ARV = antiretroviral; IBD = inflammatory bowel disease; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase inhibitor.
† IUDs do not protect against STI/HIV. If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission
§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

References

1. Cramer DW, Schiff I, Schoenbaum SC, Gibson M, Belisle S, Albrecht B, et al. Tubal infertility and the intrauterine device. N Engl J Med 1985;312:941–7.
2. Daling JR, Weiss NS, Metch BJ, Chow WH, Soderstrom RM, Moore DE, et al. Primary tubal infertility in relation to the use of an intrauterine device. N Engl J Med 1985;312:937–41.
3. Daling JR, Weiss NS, Voigt LF, McKnight B, Moore DE. The intrauterine device and primary tubal infertility. N Eng J Med 1992;326:203–4.
4. Delbarge W, Bátár I, Bafort M, Bonnivert J, Colmant C, Dhont M, et al. Return to fertility in nulliparous and parous women after removal of the GyneFix intrauterine contraceptive system. Eur J Contracept Reprod Health Care 2002;7:24–30.
5. Doll H, Vessey M, Painter R. Return of fertility in nulliparous women after discontinuation of the intrauterine device: comparison with women discontinuing other methods of contraception. BJOG 2001;108:304–14.
6. Hubacher D, et al. Use of copper intrauterine devices and the risk of tubal infertility among nulligravid women. N Engl J Med 2001;345:561–7.
7. Skjeldestad FE, Bratt H. Return of fertility after use of IUDs (Nova-T, MLCu250 and MLCu375). Adv Contracep 1987;3:139–45.
8. Urbach DR, Marrett LD, Kung R, Cohen MM. Association of perforation of the appendix with female tubal infertility. Am J Epidemiol 2001;153:566–71.
9. Wilson JC. A prospective New Zealand study of fertility after removal of copper intrauterine contraceptive devices for conception and because of complications: a four-year study. Am J Obstet Gynecol 1989;160:391–6.
10. Thiery M, Vanderpas H, Delbeke L, Vankets H. Comparative performance of 2 copper-wired IUDs (Ml-Cu-250 and T-Cu-200): immediate postpartum and interval insertion. Contracept Deliv Syst 1980;1:27–35.
11. Thiery M, Van Kets H, Van der PH, van Os W, Dombrowicz N. The ML Cu250; clinical experience in Belgium and the Netherlands. Br J Obstet Gynaecol 1982;89:51–3.
12. Brenner PF. A clinical trial of the Delta-T intrauterine device: immediate postpartum insertion. Contraception 1983;28:135–47.
13. Chi IC, Wilkens L, Rogers S. Expulsions in immediate postpartum insertions of Lippes loop D and copper T IUDs and their counterpart Delta devices—an epidemiological analysis. Contraception 1985;32:119–34.
14. Morrison C, Waszak C, Katz K, Diabate F, Mate EM. Clinical outcomes of two early postpartum IUD insertion programs in Africa. Contraception 1996;53:17–21.
15. El-Shafei MM, Mashali A, Hassan EO, El-Boghdadi, El-Lakkany N. Postpartum and postabortion intrauterine device insertion unmet needs of safe reproductive health: three years experience of a Mansoura University Hospital. Egypt Soc Obstet Gynecol 2000;26:253–62.
16. Muller ALL, Ramos JGL, Martins-Costa SH, et al. Transvaginal ultrasonographic assessment of the expulsion rate of intrauterine devices inserted in the immediate postpartum period: a pilot study. Contraception 2005;72:192–5.
17. Zhou SW, Chi IC. Immediate postpartum IUD insertions in a Chinese hospital—a two year follow-up. Int J Gynaecol Obstet 1991;35:157–64.
18. Bonilla Rosales F, Aguilar Zamudio ME, Cazares Montero Mde L, Hernandez Ortiz ME, Luna Ruiz MA. Factors for expulsion of intrauterine device Tcu380A applied immediately postpartum and after a delayed period [in Spanish]. Rev Med Inst Mex Seguro Soc 2005;43:5–10.
19. Lara R, Sanchez RA, Aznar R. Application of intreauterine device through the incision of the Cesarean section [in Spanish]. Ginecol Obstet Mex 1989;57:23–7.
20. Welkovic S, Costa LO, Faundes A, de Alencar Ximenes R, Costa CF. Post-partum bleeding and infection after post-placental IUD insertion. Contraception 2001;63:155–8.
21. Celen S, Moroy P, Sucak A, Aktulay A, Danisman N. Clinical outcomes of early postplacental insertion of intrauterine contraceptive devices. Contraception 2004;69:279–82.
22. Eroglu K, Akkuzu G, Vural G, et al. Comparison of efficacy and complications of IUD insertion in immediate postplacental/early postpartum period with interval period: 1 year follow-up. Contraception 2006;74:376–81.

23. Mishell DR, Jr., Roy S. Copper intrauterine contraceptive device event rates following insertion 4 to 8 weeks post partum. Am J Obstet Gynecol 1982;143:29–35.
24. World Health Organization's Special Programme of Research DaRTiHR. Task Force on Intrauterine Devices for Fertility Regulation. IUD insertion following spontaneous abortion: a clinical trial of the TCu 220C, Lippes loop D, and copper 7. Stud Fam Plann 1983;14:109–14.
25. World Health Organization's Special Programme of Research DaRTiHR. Task Force on Intrauterine Devices for Fertility Regulation. IUD insertion following termination of pregnancy: a clinical trial of the TCu 220C, Lippes loop D, and copper 7. Stud Fam Plann 1983;14:99–108.
26. World Health Organization's Special Programme of Research DaRTiHR. Task Force on Intrauterine Devices for Fertility Regulation. The Alza T IPCS 52, a longer acting progesterone IUD: safety and efficacy compared to the TCu220C and multiload 250 in two randomized multicentre trials. Clin Reprod Fertil 1983;2:113–28.
27. El Tagy A, Sakr E, Sokal DC, Issa AH. Safety and acceptability of postabortal IUD insertion and the importance of counseling. Contraception 2003;67:229–34.
28. Gillett PG, Lee NH, Yuzpe AA, Cerskus I. A comparison of the efficacy and acceptability of the copper-7 intrauterine device following immediate or delayed insertion after first-trimester therapeutic abortion. Fertil Steril 1980;34:121–4.
29. Grimes D, Schulz K, Stanwood N. Immediate postabortal insertion of intrauterine devices. [update of Cochrane Database Syst Rev. 2000;(2):CD001777; PMID:10796820]. [Review]. Cochrane Database Syst Rev 2002;CD001777.
30. Gupta I, Devi PK. Studies on immediate post-abortion copper 'T' device. Indian J Med Res 1975;63:736–9.
31. Moussa A. Evaluation of postabortion IUD insertion in Egyptian women. Contraception 2001;63:315–7.
32. Pakarinen P, Toivonen J, Luukkainen T. Randomized comparison of levonorgestrel- and copper-releasing intrauterine systems immediately after abortion, with 5 years' follow-up. Contraception 2003;68:31–4.
33. Stanwood NL, Grimes DA, Schulz KF. Insertion of an intrauterine contraceptive device after induced or spontaneous abortion: a review of the evidence. BJOG 2001;108:1168–73.
34. Suvisaari J, Lahteenmaki P. Detailed analysis of menstrual bleeding patterns after postmensstrual and postabortal insertion of a copper IUD or a levonorgestrel-releasing intrauterine system. Contraception 1996;54:201–8.
35. Timonen H, Luukkainen T. Immediate postabortion insertion of the copper-T (TCu-200) with eighteen months follow-up. Contraception 1974;9:153–60.
36. Tuveng JM, Skjeldestad FE, Iverson T. Postabortal insertion of IUD. Adv Contracept 1986;2:387–92.
37. Zhang PZ. Five years experience with the copper T 200 in Shanghai—856 cases. Contraception 1980;22:561–71.
38. Cardiovascular disease and use of oral and injectable progestogen-only contraceptives and combined injectable contraceptives. Results of an international, multicenter, case-control study. World Health Organization Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception. Contraception 1998;57:315–24.
39. Heinemann LA, Assmann A, DoMinh T, et al. Oral progestogen-only contraceptives and cardiovascular risk: results from the Transnational Study on Oral Contraceptives and the Health of Young Women. Eur J Contracept Reprod Health Care 1999;4:67–73.
40. Vasilakis C, Jick H, Mar Melero-Montes M. Risk of idiopathic venous thromboembolism in users of progestogens alone. Lancet 1999;354:1610–1.
41. Kingman CE, Kadir RA, Lee CA, et al. The use of the levonorgestrel-releasing intrauterine system for treatment of menorrhagia in women withinherited bleeding disorders. BJOG 2004;111:1425–8.
42. Pisoni CN, Cuadrado MJ, Khamashta MA, et al. Treatment of menorrhagia associated with oral anticoagulation: efficacy and safety of the levonorgestrel releasing intrauterine device (Mirena coil). Lupus 2006;15:877–80.
43. Schaedel ZE, Dolan G, Powell MC. The use of the levonorgestrel-releasing intrauterine system in the management of menorrhagia in women with hemostatic disorders. Am J Obstet Gynecol 2005;193:1361–3.
44. Lukes AS, Reardon B, Arepally G. Use of the levonorgestrel-releasing intrauterine system in women with hemostatic disorders. Fertil Steril 2008;90:673–7.
45. Wilson W, Taubert KA, Gewitz M et al. Prevention of infective endocarditis: guidelines from the American Heart Association: a guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. Circulation. 2007;116:1736–1754.
46. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co; 1994.
47. Avila WS, Grinberg M, Melo NR, Aristodemo PJ, Pileggi F. Contraceptive use in women with heart disease [in Portuguese]. Arq Bras Cardiol 1996;66:205–11.
48. Suri V, Aggarwal N, Kaur R, et al. Safety of intrauterine contraceptive device (copper T 200 B) in women with cardiac disease. Contraception 2008;78:315–8.
49. Bernatsky S, Ramsey-Goldman R, Gordon C, et al. Factors associated with abnormal Pap results in systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1386–9.
50. Bernatsky S, Clarke A, Ramsey-Goldman R, et al. Hormonal exposures and breast cancer in a sample of women with systemic lupus erythematosus. Rheumatology (Oxford) 2004;43:1178–81.
51. Chopra N, Koren S, Greer WL, et al. Factor V Leiden, prothrombin gene mutation, and thrombosis risk in patients with antiphospholipid antibodies. J Rheumatol 2002;29:1683–8.
52. Esdaile JM, Abrahamowicz M, Grodzicky T, et al. Traditional Framingham risk factors fail to fully account for accelerated atherosclerosis in systemic lupus erythematosus. Arthritis Rheum 2001;44:2331–7.
53. Julkunen HA. Oral contraceptives in systemic lupus erythematosus: side-effects and influence on the activity of SLE. Scand J Rheumatol 1991;20:427–33.
54. Julkunen HA, Kaaja R, Friman C. Contraceptive practice in women with systemic lupus erythematosus. Br J Rheumatol 1993;32:227–30.
55 Jungers P, Dougados M, Pelissier C, et al. Influence of oral contraceptive therapy on the activity of systemic lupus erythematosus. Arthritis Rheum 1982;25:618–23.
56. Manzi S, Meilahn EN, Rairie JE, et al. Age-specific incidence rates of myocardial infarction and angina in women with systemic lupus erythematosus: comparison with the Framingham Study. Am J Epidemiol 1997;145:408–15.
57. McAlindon T, Giannotta L, Taub N, et al. Environmental factors predicting nephristis in systemic lupus erythematosus. Ann Rheum Dis 1993;52:720–4.
58. McDonald J, Stewart J, Urowitz MB, et al. Peripheral vascular disease in patients with systemic lupus erythematosus. Ann Rheum Dis 1992;51:56–60.
59. Mintz G, Gutierrez G, Deleze M, et al. Contraception with progestogens in systemic lupus erythematosus. Contraception 1984;30:29–38.
60. Petri M. Musculoskeletal complications of systemic lupus erythematosus in the Hopkins Lupus Cohort: an update. Arthritis Care Res 1995;8:137–45.
61. Petri M, Kim MY, Kalunian KC, et al. Combined oral contraceptives in women with systemic lupus erythematosus. N Engl J Med 2005;353:2550–8.

62. Petri M. Lupus in Baltimore: evidence-based 'clinical perarls' from the Hopkins Lupus Cohort. Lupus 2005;14:970–3.
63. Sanchez-Guerrero J, Uribe AG, Jimenez-Santana L, et al. A trial of contraceptive methods in women with systemic lupus erythematosus. N Eng J Med 2005;353:2539–49.
64. Sarabi ZS, Chang E, Bobba R, et al. Incidence rates of arterial and venous thrombosis after diagnosis of systemic lupus erythematosus. Arthritis Rheum 2005;53:609–12.
65. Somers E, Magder LS, Petri M. Antiphospholipid antibodies and incidence of venous thrombosis in a cohort of patients with systemic lupus erythematosus. J Rheumatol 2002;29:2531–6.
66. Urowitz MB, Bookman AA, Koehler BE, et al. The bimodal mortality pattern of systemic lupus erythematosus. Am J Med 1976;60:221–5.
67. Choojitarom K, Verasertniyom O, Totemchokchyakarn K, et al. Lupus nephritis and Raynaud's phenomenon are significant risk factors for vascular thrombosis in SLE patients with positive antiphospholipid antibodies. Clin Rheumatol 2008;27:345–51.
68. Wahl DG, Guillemin F, de Maistre E, et al. Risk for venous thrombosis related to antiphospholipid antibodies in systemic lupus erythematosus—a meta-analysis. Lupus 1997;6:467–73.
69. Barrington JW, Arunkalaivanan AS, bdel-Fattah M. Comparison between the levonorgestrel intrauterine system (LNG-IUS) and thermal balloon ablation in the treatment of menorrhagia. Eur J Obstet Gynecol Reprod Biol 2003;108:72–4.
70. Gupta B, Mittal S, Misra R, Deka D, Dadhwal V. Levonorgestrel-releasing intrauterine system vs. transcervical endometrial resection for dysfunctional uterine bleeding. Int J Gynaecol Obstet 2006;95:261–6.
71. Hurskainen R, Teperi J, Rissanen P, et al. Quality of life and cost-effectiveness of levonorgestrel-releasing intrauterine system versus hysterectomy for treatment of menorrhagia: a randomised trial [see comment]. Lancet 2001;357:273–7.
72. Istre O, Trolle B. Treatment of menorrhagia with the levonorgestrel intrauterine system versus endometrial resection. Fertil Steril 2001;76:304–9.
73. Koh SC, Singh K. The effect of levonorgestrel-releasing intrauterine system use on menstrual blood loss and the hemostatic, fibrinolytic/inhibitor systems in women with menorrhagia. J Thromb Haemost 2007;5:133–8.
74. Lethaby AE, Cooke I, Rees M. Progesterone/progestogen releasing intrauterine systems versus either placebo or any other medication for heavy menstrual bleeding. Cochrane Database Syst Rev 2000;CD002126.
75. Magalhaes J, Aldrighi JM, de Lima GR. Uterine volume and menstrual patterns in users of the levonorgestrel-releasing intrauterine system with idiopathic menorrhagia or menorrhagia due to leiomyomas. Contraception 2007;75:193–8.
76. Stewart A, Cummins C, Gold L, Jordan R, Phillips W. The effectiveness of the levonorgestrel-releasing intrauterine system in menorrhagia: a systematic review.
77. Fedele L, Bianchi S, Zanconato G, Portuese A, Raffaelli R. Use of a levonorgestrel-releasing intrauterine device in the treatment of rectovaginal endometriosis. Fertil Steril 2001;75:485–8.
78. Lockhat FBE. The effect of a levonorgestrel intrauterine system (LNG-IUS) on symptomatic endometriosis. Fertil Steril 2002;77 Suppl 1:S24.
79. Petta CA, Ferriani RA, Abrao MS, et al. Randomized clinical trial of a levonorgestrel-releasing intrauterine system and a depot GnRH analogue for the treatment of chronic pelvic pain in women with endometriosis. Hum Reprod 2005;20:1993–8.
80. Vercellini P, Aimi G, Panazza S, et al. A levonorgestrel-releasing intrauterine system for the treatment of dysmenorrhea associated with endometriosis: a pilot study. Fertil Steril 1999;72:505–8.
81. Vercellini P, Frontino G, De Giorgi O, et al. Comparison of a levonorgestrel-releasing intrauterine device versus expectant management after conservative surgery for symptomatic endometriosis: a pilot study. Fertil Steril 2003;80:305–9.
82. Deicas RE, Miller DS, Rademaker AW, Lurain JR. The role of contraception in the development of postmolar trophoblastic tumour. Obstet Gynecol 1991;78:221–6.
83. Adewole IF, Oladokun A, Fawole AO, Olawuyi JF, Adeleye JA. Fertility regulatory methods and development of complications after evacuation of complete hydatidiform mole. J Obstet Gynecol 2000;20:68–9.
84. Ho Yuen B, Burch P. Relationship of oral contraceptives and the intrauterine contraceptive devices to the regression of concentration of the beta subunit of human chorionic gonadotropin and invasive complications after molar pregnancy. Am J Obstet Gynecoy 1983;145:214–7.
85. Haimovich S, Checa MA, Mancebo G, Fuste P, Carreras R. Treatment of endometrial hyperplasia without atypia in peri- and postmenopausal women with a levonorgestrel intrauterine device. Menopause 2008;15:1002–7.
86. Varma R, Soneja H, Bhatia K, et al. The effectiveness of a levonorgestrel-releasing intrauterine system (LNG-IUS) in the treatment of endometrial hyperplasia—a long-term follow-up study. Eur J Obstet Gynecol Reprod Biol 2008;139:169–75.
87. Wheeler DT, Bristow RE, Kurman RJ. Histologic alterations in endometrial hyperplasia and well-differentiated carcinoma treated with progestins. Am J Surg Pathol 2007;31:988–98.
88. Wildemeersch D, Janssens D, Pylyser K, et al. Management of patients with non-atypical and atypical endometrial hyperplasia with a levonorgestrel-releasing intrauterine system: long-term follow-up. Maturitas 2007;57:210–3.
89. Clark TJ, Neelakantan D, Gupta JK. The management of endometrial hyperplasia: an evaluation of current practice. Eur J Obstet Gynecol Reprod Biol 2006;125:259–64.
90. Vereide AB, Arnes M, Straume B, Maltau JM, Orbo A. Nuclear morphometric changes and therapy monitoring in patients with endometrial hyperplasia: a study comparing effects of intrauterine levonorgestrel and systemic medroxyprogesterone. Gynecol Oncol 2003;91:526–33.
91. Perino A, Quartararo P, Catinella E, Genova G, Cittadini E. Treatment of endometrial hyperplasia with levonorgestrel releasing intrauterine devices. Acta Eur Fertil 1987;18:137–40.
92. Scarselli G, Mencaglia L, Tantini C, Colafranceschi M, Taddei G. Hysteroscopic evaluation of intrauterine progesterone contraceptive system as a treatment for abnormal uterine bleeding. Acta Eur Fertil 1984;15:279–82.
93. Orbo A, Arnes M, Hancke C, et al. Treatment results of endometrial hyperplasia after prospective D-score classification: a follow-up study comparing effect of LNG-IUD and oral progestins versus observation only. Gynecol Oncol 2008;111:68–73.
94. Jindabanjerd K, Taneepanichskul S. The use of levonorgestrel–IUD in the treatment of uterine myoma in Thai women. J Med Assoc Thai 2006;89 Suppl 4:S147–51.
95. Tasci Y, Caglar GS, Kayikcioglu F, Cengiz H, Yagci B, Gunes M. Treatment of menorrhagia with the levonorgestrel releasing intrauterine system: effects on ovarian function and uterus. Arch Gynecol Obstet 2009;280:39–42
96. Rosa E Silva JC, de Sa Rosa e Silva AC, Candido dos Reis FJ, et al. Use of a levonorgestrel-releasing intrauterine device for the symptomatic treatment of uterine myomas. J Reprod Med 2005;50:613–7.
97. Mercorio F, De SR, Di Spiezio SA, et al. The effect of a levonorgestrel-releasing intrauterine device in the treatment of myoma-related menorrhagia. Contraception 2003;67:277–80.

98. Grigorieva V, Chen-Mok M, Tarasova M, Mikhailov A. Use of a levonorgestrel-releasing intrauterine system to treat bledding related to uterine leiomyomas. Fertil Steril 2003;79:1194–8.
99. Starczewski A, Iwanicki M. Intrauterine therapy with levonorgestrel releasing IUD of women with hypermenorrhea secondary to uterine fibroids [in Polish]. Ginekol Pol 2000;71:1221-5.
100. Soysal S, Soysal ME. The efficacy of levonorgestrel-releasing intrauterine device in selected cases of myoma-related menorrhagia: a prospective controlled trial. Gynecol Obstet Invest 2005;59:29–35.
101. Ikomi A, Mansell E, Spence-Jones C, Singer A. Treatment of menorrhagia with the levonorgestrel intrauterine system: can we learn from our failures? J Obstet Gynaecol 2000;20:630–1.
102. Larsson B, Wennergren M. Investigation of a copper-intrauterine device (Cu-IUD) for possible effect on frequency and healing of pelvic inflammatory disease. Contraception 1977;15:143–9.
103. Soderberg G, Lindgren S. Influence of an intrauterine device on the course of an acute salpingitis. Contraception 1981;24:137–43.
104. Teisala K. Removal of an intrauterine device and the treatment of acute pelvic inflammatory disease. Ann Med 1989;21:63–5.
105. Faúndes A, Telles E, Cristofoletti ML, Faúndes D, Castro S, Hardy E. The risk of inadvertent intrauterine device insertion in women carriers of endocervical *Chlamydia trachomatis*. Contraception 1998;58:105–9.
106. Ferraz do Lago R, Simões JA, Bahamondes L, et al. Follow-up of users of intrauterine device with and without bacterial vaginosis and other cervicovaginal infections. Contraception 2003;68:105–9.
107. Morrison CS, Sekadde-Kigondu C, Miller WC, Weiner DH, Sinei SK. Use of sexually transmitted disease risk assessment algorithms for selection of intrauterine device candidates. Contraception 1999;59:97–106.
108. Pap-Akeson M, Solheim F, Thorbert G, Akerlund M. Genital tract infections associated with the intrauterine contraceptive device can be reduced by inserting the threads into the uterine cavity. Br J Obstet Gynaecol 1992;99:676–9.
109. Sinei SK, Schulz KF, Lamptey PR, Grimes DA, Mati JK, Rosenthal SM, et al. Preventing IUDC-related pelvic infection: the efficacy of prophylactic doxycycline at insertion. Br J Obstet Gynaecol 1990;97:412–9.
110. Skjeldestad FE, Halvorsen LE, Kahn H, Nordbø SA, Saake K. IUD users in Norway are at low risk of for genital *C. trachomatis* infection. Contraception 1996;54:209–12.
111. Walsh TL, Bernstein GS, Grimes DA, Frezieres R, Bernstein L, Coulson AH. Effect of prophylactic antibiotics on morbidity associated with IUD insertion: results of a pilot randomized controlled trial. Contraception 1994;50:319–27.
112. European Study Group on Heterosexual Transmission of HIV. Comparison of female to male and male to female transmission of HIV in 563 stable couples. BMJ 1992;304:809–13.
113. Carael M, Van de Perre PH, Lepage PH, et al. Human immunodeficiency virus transmission among heterosexual couples in Central Africa. AIDS 1988;2:201–5.
114. Kapiga SH, Shao JF, Lwihula GK, Hunter DJ. Risk factors for HIV infection among women in Dar-es-Salaam, Tanzania. J Acquir Immune Defic Syndr 1994;7:301–9.
115. Kapiga SH, Lyamuya EF, Lwihula GK, Hunter DJ. The incidence of HIV infection among women using family planning methods in Dar es Salaam, Tanzania. AIDS 1998;12:75–84.
116. Mann JM, Nzilambi N, Piot P, et al. HIV infection and associated risk factors in female prostitutes in Kinshasa, Zaire. AIDS 1998;2:249–54.
117. Martin HL, Jr., Nyange PM, Richardson BA, et al. Hormonal contraception, sexually transmitted diseases, and risk of heterosexual transmission of human immunodeficiency virus type 1. J Infect Dis 1998;178:1053–9.
118. Mati JK, Hunter DJ, Maggwa BN, Tukei PM. Contraceptive use and the risk of HIV infection in Nairobi, Kenya. Int J Gynaecol Obstet 1995;48:61–7.
119. Nicolosi A, Correa Leite ML, Musicco M, et al. The efficiency of male-to-female and female-to-male sexual transmission of the human immunodeficiency virus: a study of 730 stable couples. Italian Study Group on HIV Heterosexual Transmission [comment]. Epidemiology 1994;5:570–5.
120. Plourde PJ, Plummer FA, Pepin J, et al. Human immunodeficiency virus type 1 infection in women attending a sexually transmitted diseases clinic in Kenya [comment]. J Infect Dis 1992;166:86–92.
121. Sinei SK, Fortney JA, Kigondu CS, et al. Contraceptive use and HIV infection in Kenyan family planning clinic attenders. Int J STD AIDS 1996;7:65–70.
122. Spence MR, Robbins SM, Polansky M, Schable CA. Seroprevalence of human immunodeficiency virus type I (HIV-1) antibodies in a family-planning population. Sex Transm Dis 1991;18:143–5.
123. Morrison CS, Sekadde-Kigondu C, Sinei SK, et al. Is the intrauterine device appropriate contraception for HIV-1–infected women? BJOG 2001;108:784–90.
124. Richardson BA, Morrison CS, Sekadde-Kigondu C, et al. Effect of intrauterine device use on cervical shedding of HIV-1 DNA. AIDS 1999;13:2091–7.
125. Sinei SK, Morrison CS, Sekadde-Kigondu C, Allen M, Kokonya D. Complications of use of intrauterine devices among HIV-1–infected women. Lancet 1998;351:1238–41.
126. Mostad SB, Overbaugh J, DeVange DM, et al. Hormonal contraception, vitamin A deficiency, and other risk factors for shedding of HIV-1 infected cells from the cervix and vagina. Lancet 1997;350:922–7.
127. Kovacs A, Wasserman SS, Burns D, et al. Determinants of HIV-1 shedding in the genital tract of women. Lancet 2001;358:1593–601.
128. Stringer EM, Kaseba C, Levy J, et al. A randomized trial of the intrauterine contraceptive device vs hormonal contraception in women who are infected with the human immunodeficiency virus. Am J Obstet Gynecol 2007;197:144–8.
129. Heikinheimo O, Lehtovirta P, Suni J, Paavonen J. The levonorgestrel-releasing intrauterine system (LNG-IUS) in HIV-infected women—effects on bleeding patterns, ovarian function and genital shedding of HIV. Hum Reprod 2006;21:2857–61.
130. Lehtovirta P, Paavonen J, Heikinheimo O. Experience with the levonorgestrel-releasing intrauterine system among HIV-infected women. Contraception 2007;75:37–9.
131. Grigoryan OR, Grodnitskaya EE, Andreeva EN, et al. Contraception in perimenopausal women with diabetes mellitus. Gynecol Endocrinol 2006;22:198–206.
132. Rogovskaya S, Rivera R, Grimes DA, et al. Effect of a levonorgestrel intrauterine system on women with type 1 diabetes: a randomized trial. Obstet Gynecol 2005;105:811–5.
133. Cox M, Tripp J, Blacksell S. Clinical performance of the levonorgestrel intrauterine system in routine use by the UK Family Planning and Reproductive Health Research Network: 5-year report. J Fam Plann Reprod Health Care 2002;28:73–7.
134. Wakeman J. Exacerbation of Crohn's disease after insertion of a levonorgestrel intrauterine system: a case report. J Fam Plann Reprod Health Care 2003;29:154.

135. Fong YF, Singh K. Effect of the levonorgestrel-releasing intrauterine system on uterine myomas in a renal transplant patient. Contraception 1999;60:51–3.
136. Zerner J, Doil KL, Drewry J, Leeber DA. Intrauterine contraceptive device failures in renal transplant patients. J Reprod Med 1981;26:99–102.
137. Lessan-Pezeshki M, Ghazizadeh S, Khatami MR, et al. Fertility and contraceptive issues after kidney transplantation in women. Transplant Proc 2004;36:1405–6.
138. O'Donnell D. Contraception in the female transplant recipient. Dialysis & Transplantation 1986;15:610,612.
139. Bounds W, Guillebaud J. Observational series on women using the contraceptive Mirena concurrently with anti-epileptic and other enzyme-inducing drugs. J Fam Plann Reprod Health Care 2002;28:78–80.
140. Reimers A, Helde G, Brodtkorb E. Ethinyl estradiol, not progestogens, reduces lamotrigine serum concentrations. Epilepsia 2005;46:1414–7.

Appendix F

Classifications for Copper Intrauterine Devices for Emergency Contraception

A copper IUD (Cu-IUD) can be used within 5 days of unprotected intercourse as an emergency contraceptive. However, when the time of ovulation can be estimated, the Cu-IUD can be inserted beyond 5 days after intercourse, if necessary, as long as the insertion does not occur >5 days after ovulation.

The eligibility criteria for interval Cu-IUD insertion also apply for the insertion of Cu-IUDs as emergency contraception (Box). Cu-IUDs for emergency contraception do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

BOX. Categories for Classifying Cu-IUDs as Emergency Contraception

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for copper intrauterine devices for emergency contraception*†

Condition	Category	Clarifications/Evidence/Comments
Pregnancy	4	**Clarification**: IUD use is not indicated during pregnancy and should not be used because of the risk for serious pelvic infection and septic spontaneous abortion.
Rape		
a. High risk for STI	3	**Comment:** IUDs do not protect against STI/HIV or PID. Among women with chlamydial infection or gonorrhea, the potential increased risk for PID with IUD insertion should be avoided. The concern is less for other STIs.
b. Low risk for STI	1	

* Abbreviations: IUD = intrauterine device; Cu-IUD = copper IUD; STI = sexually transmitted infection; HIV = human immunodeficiency virus; PID = pelvic inflammatory disease

† Cu-IUDs for emergency contraception do not protect against STI/HIV. If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

Appendix G
Classifications for Barrier Methods

Classifications for barrier contraceptive methods include those for condoms, which include male latex condoms, male polyurethane condoms, and female condoms; spermicides; and diaphragm with spermicide or cervical cap (Box). Consistent and correct use of the male latex condom reduces the risk for STI/HIV transmission.

Women with conditions that make pregnancy an unacceptable risk should be advised that barrier methods for pregnancy prevention may not be appropriate for those who cannot use them consistently and correctly because of the relatively higher typical-use failure rates of these methods.

BOX. Categories for Classifying Barrier Methods

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category: Condom	Category: Spermicide	Category: Diaphragm/cap	Clarifications/Evidence/Comments
Personal Characteristics and Reproductive History				
Pregnancy	Not applicable	Not applicable	Not applicable	**Clarification:** None of these methods are relevant for contraception during known pregnancy. However, for women who remain at risk for STI/HIV during pregnancy, the correct and consistent use of condoms is recommended.
Age				
a. Menarche to <40 yrs	1	1	1	
b. ≥40 yrs	1	1	1	
Parity				
a. Nulliparous	1	1	1	
b. Parous	1	1	2	**Clarification:** Risk for cervical cap failure is higher in parous women than in nulliparous women.
Postpartum				
a. <6 wks postpartum	1	1	Not applicable	**Clarification:** Diaphragm and cap are unsuitable until uterine involution is complete.
b. ≥6 wks postpartum	1	1	1	
Postabortion				
a. First trimester	1	1	1	
b. Second trimester	1	1	1	**Clarification:** Diaphragm and cap are unsuitable until 6 weeks after second trimester abortion.
c. Immediate postseptic abortion	1	1	1	
Past ectopic pregnancy	1	1	1	
History of pelvic surgery	1	1	1	
Smoking				
a. Age <35 yrs	1	1	1	
b. Age ≥35 yrs				
i. <15 Cigarettes/day	1	1	1	
ii. ≥15 Cigarettes/day	1	1	1	
Obesity				**Comment:** Severe obesity might make diaphragm and cap placement difficult.
a. ≥30 kg/m^2 BMI	1	1	1	
b. Menarche to <18 yrs and ≥30 kg/m^2 BMI	1	1	1	
History of bariatric surgery§				
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	1	1	

TABLE. (*Continued*) Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category: Condom	Category: Spermicide	Category: Diaphragm/cap	Clarifications/Evidence/Comments
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	1	1	1	
Cardiovascular Disease				
Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, and hypertension)	1	1	1	
Hypertension				
a. Adequately controlled hypertension	1	1	1	
b. Elevated blood pressure levels (properly taken measurements)				
i. Systolic 140–159 mm Hg or diastolic 90–99 mm Hg	1	1	1	
ii. Systolic ≥160 mm Hg or diastolic ≥100 mm Hg§	1	1	1	
c. Vascular disease	1	1	1	
History of high blood pressure during pregnancy (where current blood pressure is measurable and normal)	1	1	1	
Deep venous thrombosis (DVT)/pulmonary embolism (PE)				
a. History of DVT/PE, not on anticoagulant therapy				
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	1	1	1	
• History of estrogen-associated DVT/PE				
• Pregnancy-associated DVT/PE				
• Idiopathic DVT/PE				
• Known thrombophilia, including antiphospholipid syndrome				
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer				
• History of recurrent DVT/PE				
ii. Lower risk for recurrent DVT/PE (no risk factors)	1	1	1	
b. Acute DVT/PE	1	1	1	
c. DVT/PE and established on anticoagulant therapy for at least 3 mos				
i. Higher risk for recurrent DVT/PE (≥1 risk factors)	1	1	1	
• Known thrombophilia, including antiphospholipid syndrome				
• Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer				
• History of recurrent DVT/PE				
ii. Lower risk for recurrent DVT/PE (no risk factors)	1	1	1	
d. Family history (first-degree relatives)	1	1	1	
e. Major surgery				
i. With prolonged immobilization	1	1	1	
ii. Without prolonged immobilization	1	1	1	
f. Minor surgery without immobilization	1	1	1	
Known thrombogenic mutations§ (e.g., factor V Leiden; prothrombin mutation; protein S, protein C, and antithrombin deficiencies)	1	1	1	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening.

TABLE. (*Continued*) Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category: Condom	Category: Spermicide	Category: Diaphragm/cap	Clarifications/Evidence/Comments
Superficial venous thrombosis				
a. Varicose veins	1	1	1	
b. Superficial thrombophlebitis	1	1	1	
Current and history of ischemic heart disease§	1	1	1	
Stroke§ (history of cerebrovascular accident)	1	1	1	
Known hyperlipidemias	1	1	1	**Clarification:** Routine screening is not appropriate because of the rarity of the conditions and the high cost of screening.
Valvular heart disease				
a. Uncomplicated	1	1	1	
b. Complicated§ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)	1	1	2	
Peripartum cardiomyopathy§				
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (*1*)				
i. <6 mos	1	1	1	
ii. ≥6 mos	1	1	1	
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (*1*)	1	1	1	
Rheumatic Diseases				
Systemic lupus erythematosus§				
a. Positive (or unknown) antiphospholipid antibodies	1	1	1	
b. Severe thrombocytopenia	1	1	1	
c. Immunosuppressive treatment	1	1	1	
d. None of the above	1	1	1	
Rheumatoid arthritis				
a. On immunosuppressive therapy	1	1	1	
b. Not on immunosuppressive therapy	1	1	1	
Neurologic Conditions				
Headaches				
a. Non-migrainous (mild or severe)	1	1	1	
b. Migraine				
i. Without aura				
• Age <35 yrs	1	1	1	
• Age ≥35 yrs	1	1	1	
ii. With aura, at any age	1	1	1	
Epilepsy§	1	1	1	
Depressive Disorders				
Depressive disorders	1	1	1	
Reproductive Tract Infections and Disorders				
Unexplained vaginal bleeding (suspicious for serious condition) Before evaluation	1	1	1	**Clarification:** If pregnancy or an underlying pathological condition (such as pelvic malignancy) is suspected, it must be evaluated and the category adjusted after evaluation.
Endometriosis	1	1	1	
Benign ovarian tumors (including cysts)	1	1	1	
Severe dysmenorrhea	1	1	1	

TABLE. (*Continued*) Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category: Condom	Category: Spermicide	Category: Diaphragm/cap	Clarifications/Evidence/Comments
Gestational trophoblastic disease				
a. Decreasing or undetectable β–hCG levels	1	1	1	
b. Persistently elevated β-hCG levels or malignant disease§	1	1	1	
Cervical ectropion	1	1	1	
Cervical intraepithelial neoplasia	1	1	1	**Clarification: The cap should not be used.** Diaphragm use has no restrictions.
Cervical cancer (awaiting treatment)	1	2	1	**Clarification: The cap should not be used.** Diaphragm use has no restrictions. **Comment:** Repeated and high-dose use of nonoxynol-9 can cause vaginal and cervical irritation or abrasions.
Breast disease				
a. Undiagnosed mass	1	1	1	
b. Benign breast disease	1	1	1	
c. Family history of cancer	1	1	1	
d. Breast cancer§				
i. Current	1	1	1	
ii. Past and no evidence of current disease for 5 yrs	1	1	1	
Endometrial hyperplasia	1	1	1	
Endometrial cancer§	1	1	1	
Ovarian cancer§	1	1	1	
Uterine fibroids	1	1	1	
Anatomical abnormalities	1	1	Not applicable	**Clarification:** The diaphragm cannot be used in certain cases of prolapse. Cap use is not appropriate for a woman with markedly distorted cervical anatomy.
Pelvic inflammatory disease (PID)				
a. Past PID (assuming no current risk factors of STIs)				
i. With subsequent pregnancy	1	1	1	
ii. Without subsequent pregnancy	1	1	1	
b. Current PID	1	1	1	
STIs				
a. Current purulent cervicitis or chlamydial infection or gonorrhea	1	1	1	
b. Other STIs (excluding HIV and hepatitis)	1	1	1	
c. Vaginitis (including *Trichomonas vaginalis* and bacterial vaginosis)	1	1	1	
d. Increased risk for STIs	1	1	1	
HIV/AIDS				
High risk for HIV	1	4	4	**Evidence:** Repeated and high-dose use of the spermicide nonoxynol-9 was associated with increased risk for genital lesions, which might increase the risk for HIV infection (*2*). **Comment:** Diaphragm use is assigned Category 4 because of concerns about the spermicide, not the diaphragm.
HIV infection§	1	3	3	**Comment:** Use of spermicides and/or diaphragms (with spermicide) can disrupt the cervical mucosa, which may increase viral shedding and HIV transmission to uninfected sex partners.
AIDS§	1	3	3	**Comment:** Use of spermicides and/or diaphragms (with spermicide) can disrupt the cervical mucosa, which may increase viral shedding and HIV transmission to uninfected sex partners
Other Infections				
Schistosomiasis				
a. Uncomplicated	1	1	1	
b. Fibrosis of liver§	1	1	1	
Tuberculosis§				
a. Nonpelvic	1	1	1	
b. Pelvic	1	1	1	

TABLE. (*Continued*) Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category			Clarifications/Evidence/Comments
	Condom	Spermicide	Diaphragm/ cap	
Malaria	1	1	1	
History of toxic shock syndrome	1	1	3	**Comment:** Toxic shock syndrome has been reported in association with contraceptive sponge and diaphragm use.
Urinary tract infection	1	1	2	**Comment:** Use of diaphragms and spermicides might increase risk for urinary tract infection.
Endocrine Conditions				
Diabetes				
a. History of gestational disease	1	1	1	
b. Nonvascular disease				
i. Noninsulin-dependent	1	1	1	
ii. Insulin-dependent§	1	1	1	
c. Nephropathy/retinopathy/neuropathy§	1	1	1	
d. Other vascular disease or diabetes of >20 yrs' duration§	1	1	1	
Thyroid disorders				
a. Simple goiter	1	1	1	
b. Hyperthyroid	1	1	1	
c. Hypothyroid	1	1	1	
Gastrointestinal Conditions				
Inflammatory bowel disease (ulcerative colitis, Crohn disease)	1	1	1	
Gallbladder disease				
a. Symptomatic				
i. Treated by cholecystectomy	1	1	1	
ii. Medically treated	1	1	1	
iii. Current	1	1	1	
b. Asymptomatic	1	1	1	
History of cholestasis				
a. Pregnancy-related	1	1	1	
b. Past COC-related	1	1	1	
Viral hepatitis				
a. Acute or flare	1	1	1	
b. Carrier	1	1	1	
c. Chronic	1	1	1	
Cirrhosis				
a. Mild (compensated)	1	1	1	
b. Severe§ (decompensated)	1	1	1	
Liver tumors				
a. Benign				
i. Focal nodular hyperplasia	1	1	1	
ii. Hepatocellular adenoma§	1	1	1	
b. Malignant§ (hepatoma)	1	1	1	
Anemias				
Thalassemia	1	1	1	
Sickle cell disease§	1	1	1	
Iron deficiency anemia	1	1	1	
Solid Organ Transplantation				
Solid organ transplantation§				
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	1	1	1	
b. Uncomplicated	1	1	1	

TABLE. (*Continued*) Classifications for barrier methods,*† including condoms, spermicides, and diaphragms/caps

Condition	Category: Condom	Category: Spermicide	Category: Diaphragm/cap	Clarifications/Evidence/Comments
Drug Interactions				
Antiretroviral (ARV) therapy				**Clarification:** No drug interaction between ARV therapy and barrier method use is known. However, HIV infection and AIDS are classified as Category 3 for spermicides and diaphragms (see HIV/AIDS condition above).
a. Nucleoside reverse transcriptase inhibitors (NRTIs)	1	3	3	
b. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	1	3	3	
c. Ritonavir-boosted protease inhibitors	1	3	3	
Anticonvulsant therapy				
a. Certain anticonvulsants (phenytoin, carbamazepine, barbiturates, primidone, topiramate, oxcarbazepine)	1	1	1	
b. Lamotrigine	1	1	1	
Antimicrobial therapy				
a. Broad-spectrum antibiotics	1	1	1	
b. Antifungals	1	1	1	
c. Antiparasitics	1	1	1	
d. Rifampicin or rifabutin therapy	1	1	1	
Allergy to latex	3	1	3	**Clarification:** The condition of allergy to latex does not apply to plastic condoms/diaphragms.

* Abbreviations: STI = sexually transmitted infection; HIV = human immunodeficiency virus; BMI, body mass index; DVT = deep venous thrombosis; PE = pulmonary embolism; ARV = antiretroviral; hCG = human chorionic gonadotropin; PID = pelvic inflammatory disease; AIDS = acquired immunodeficiency syndrome; COC = combined oral contraceptive; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase inhibitor.

† If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission. Women with conditions that make pregnancy an unacceptable risk should be advised that barrier methods for pregnancy prevention may not be appropriate for those who cannot use them consistently and correctly because of the relatively higher typical-use failure rates of these methods.

§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

References

1. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co; 1994.

2. Wilkinson D, Ramjee G, Tholandi M, Rutherford G. Nonoxynol-9 for preventing vaginal acquisition of HIV infection by women from men. Cochrane Database Syst Rev 2002;4:CD003939.

Appendix H

Classifications for Fertility Awareness–Based Methods

Fertility awareness–based (FAB) methods of family planning involve identifying the fertile days of the menstrual cycle, whether by observing fertility signs such as cervical secretions and basal body temperature or by monitoring cycle days (Box). FAB methods can be used in combination with abstinence or barrier methods during the fertile time. If barrier methods are used, refer to Appendix G.

No medical conditions become worse because of use of FAB methods. In general, FAB methods can be used without concern for health effects to persons who choose them. However, a number of conditions make their use more complex. The existence of these conditions suggests that 1) use of these methods should be delayed until the condition is corrected or resolved or 2) persons using FAB methods will require special counseling, and a more highly trained provider is generally necessary to ensure correct use.

Women with conditions that make pregnancy an unacceptable risk should be advised that FAB methods might not be appropriate for them because of the relatively higher typical-use failure rates of these methods. FAB methods do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV).

Box. Definitions for terms associated with fertility awareness–based methods

- **Symptoms-based methods**: FAB methods based on observation of fertility signs (e.g., cervical secretions, basal body temperature) such as the Cervical Mucus Method, the Symptothermal Method, and the TwoDay Method.
- **Calendar-based methods**: FAB methods based on calendar calculations such as the Calendar Rhythm Method and the Standard Days Method.
- **Acccept (A)**: There is no medical reason to deny the particular FAB method to a woman in this circumstance.
- **Caution (C)**: The method is normally provided in a routine setting but with extra preparation and precautions. For FAB methods, this usually means that special counselling might be needed to ensure correct use of the method by a woman in this circumstance.
- **Delay (D)**: Use of this method should be delayed until the condition is evaluated or corrected. Alternative temporary methods of contraception should be offered.

TABLE. Fertility awareness–based methods,*† including symptoms-based and calendar-based methods

Condition	Category: Symptom-based method	Category: Calendar-based method	Clarifications/Evidence/Comments
Personal Characteristics and Reproductive History			
Pregnancy	Not applicable		**Clarification:** FAB methods are not relevant during pregnancy.
Life stage			**Clarification:** Menstrual irregularities are common in postmenarche and perimenopause and might complicate the use of FAB methods.
a. Postmenarche	C	C	
b. Perimenopause	C	C	
Breastfeeding			**Comment:** Use of FAB methods when breastfeeding might be less effective than when not breastfeeding.
a. <6 wks postpartum	D	D	**Comment:** Women who are primarily breastfeeding and are amenorrheic are unlikely to have sufficient ovarian function to produce detectable fertility signs and hormonal changes during the first 6 months postpartum. However, the likelihood of resumption of fertility increases with time postpartum and with substitution of breast milk with other foods.
b. ≥6 wks	C	D	
c. After menses begin	C	C	**Comment:** When the woman notices fertility signs, particularly cervical secretions, she can use a symptoms-based method. First postpartum menstrual cycles in breastfeeding women vary significantly in length. Return to regularity takes several cycles. When she has had at least 3 postpartum menses and her cycles are regular again, she can use a calendar-based method. When she has had at least 4 postpartum menses and her most recent cycle lasted 26–32 days, she can use the Standard Days Method. Before that time, a barrier method should be offered if the woman plans to use a FAB method later.

TABLE. (*Continued*) Fertility awareness–based methods,*† including symptoms-based and calendar-based methods

Condition	Category: Symptom-based method	Category: Calendar-based method	Clarifications/Evidence/Comments
Postpartum (in nonbreastfeeding women)			
a. <4 wks	D	D	**Comment:** Nonbreastfeeding women are not likely to have sufficient ovarian function to either require a FAB method or to have detectable fertility signs or hormonal changes before 4 weeks postpartum. Although the risk for pregnancy is low, a method appropriate for the postpartum period should be offered.
b. ≥4 wks	A	D	**Comment:** Nonbreastfeeding women are likely to have sufficient ovarian function to produce detectable fertility signs and/or hormonal changes at this time; likelihood increases rapidly with time postpartum. Women can use calendar-based methods as soon as they have completed three postpartum menses. Methods appropriate for the postpartum period should be offered before that time.
Postabortion	C	D	**Comment:** Postabortion women are likely to have sufficient ovarian function to produce detectable fertility signs and/or hormonal changes; likelihood increases with time postabortion. Women can start using calendar-based methods after they have had at least 1 postabortion menses (e.g., women who before this pregnancy had most cycles of 26–32 days can then use the Standard Days Method). Methods appropriate for the postabortion period should be offered before that time.
Reproductive Tract Infections and Disorders			
Irregular vaginal bleeding	D	D	**Comment:** Presence of this condition makes FAB methods unreliable. Therefore, barrier methods should be recommended until the bleeding pattern is compatible with proper method use. The condition should be evaluated and treated as necessary.
Vaginal discharge	D	A	**Comment:** Because vaginal discharge makes recognition of cervical secretions difficult, the condition should be evaluated and treated if needed before providing methods based on cervical secretions.
Other			
Use of drugs that affect cycle regularity, hormones, and/or fertility signs	C/D	C/D	**Comment:** Use of certain mood-altering drugs such as lithium, tricyclic antidepressants, and antianxiety therapies, and certain antibiotics and anti-inflammatory drugs, might alter cycle regularity or affect fertility signs. The condition should be carefully evaluated and a barrier method offered until the degree of effect has been determined or the drug is no longer being used.
Diseases that elevate body temperature			
a. Chronic diseases	C	A	**Comment:** Elevated temperature levels might make basal body temperature difficult to interpret but have no effect on cervical secretions. Thus, use of a method that relies on temperature should be delayed until the acute febrile disease abates. Temperature-based methods are not appropriate for women with chronically elevated temperatures. In addition, some chronic diseases interfere with cycle regularity, making calendar-based methods difficult to interpret.
b. Acute diseases	D	A	

* Abbreviations: FAB = fertility awareness–based; A = accept; C = caution; D = delay; STI = sexually transmitted infection; HIV = human immunodeficiency infection.
† Fertility awareness–based methods do not protect against STI/HIV. If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

Appendix I
Lactational Amenorrhea Method

The Bellagio Consensus provided the scientific basis for defining the conditions under which breastfeeding can be used safely and effectively for birth-spacing purposes, and programmatic guidelines were developed for use of lactational amenorrhea in family planning (*1,2*). These guidelines include the following three criteria, all of which must be met to ensure adequate protection from an unplanned pregnancy: 1) amenorrhea; 2) fully or nearly fully breastfeeding, and 3) <6 months postpartum.

The main indications for breastfeeding are to provide an ideal food for the infant and protect against disease. No medical conditions exist for which use of the lactational amenorrhea method for contraception is restricted. However, breastfeeding might not be recommended for women or infants with certain conditions.

Women with conditions that make pregnancy an unacceptable risk should be advised that the lactational amenorrhea method might not be appropriate for them because of its relatively higher typical-use failure rates. The lactational amenorrhea method does not protect against sexually transmitted infections (STIs) and human immunodeficiency virus (HIV). If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

HIV Infection

HIV can be transmitted from mother to infant through breastfeeding. Therefore, in the United States, where replacement feeding is affordable, feasible, acceptable, sustainable, and safe, breastfeeding for women with HIV is not recommended (*3,4*).

Other Medical Conditions

The American Academy of Pediatrics also recommends against breastfeeding for women with active untreated tuberculosis disease, who are positive for human T-cell lymphotropic virus types I or II, or who have herpes simplex lesions on a breast (infant can feed from the other breast). In addition, infants with classic galactosemia should not breastfeed (*4*).

Medication Used during Breastfeeding

To protect infant health, the American Academy of Pediatrics does not recommend breastfeeding for women receiving certain drugs, including diagnostic or therapeutic radioactive isotopes or exposure to radioactive materials, antimetabolites or chemotherapeutic agents, and current use of drugs of abuse (*4*).

References

1. Kennedy KI, Rivera R, McNeilly AS. Consensus statement on the use of breastfeeding as a family planning method. Contraception 1989;39:477–96.
2. Labbok M, Cooney K, Coly S. Guidelines: breastfeeding, family planning, and the Lactational Amenorrhea Method-LAM. Washington, DC: Institute for Reproductive Health; 1994.
3. Perinatal HIV Guidelines Working Group. Public Health Service Task Force recommendations for use of antiretroviral drugs in pregnant HIV-infected women for maternal health and interventions to reduce perinatal HIV transmission in the United States. Rockville, MD: Public Health Service Task Force; 2009.
4. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk. Pediatrics 2005;115:496–506.

Appendix J

Coitus Interruptus (Withdrawal)

Coitus interruptus (CI), also known as withdrawal, is a traditional family planning method in which the man completely removes his penis from the vagina, and away from the external genitalia of the female partner, before he ejaculates. CI prevents sperm from entering the woman's vagina, thereby preventing contact between spermatozoa and the ovum.

This method might be appropriate for couples

- who are highly motivated and able to use this method effectively;
- with religious or philosophical reasons for not using other methods of contraception;
- who need contraception immediately and have entered into a sexual act without alternative methods available;
- who need a temporary method while awaiting the start of another method; or
- who have intercourse infrequently.

Some benefits of CI are that the method, if used correctly, does not affect breastfeeding and is always available for primary use or use as a back-up method. In addition, CI involves no economic cost or use of chemicals. CI has no directly associated health risks. CI does not protect against sexually transmitted infections (STIs) and human immunodeficiency virus (HIV). If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

CI is unforgiving of incorrect use, and its effectiveness depends on the willingness and ability of the couple to use withdrawal with every act of intercourse. Women with conditions that make pregnancy an unacceptable risk should be advised that CI might not be appropriate for them because of its relatively higher typical-use failure rates.

Appendix K
Female and Male Sterilization

Tubal sterilization for women and vasectomy for men are permanent, safe, and highly effective methods of contraception. In general, no medical conditions would absolutely restrict a person's eligibility for sterilization (with the exception of known allergy or hypersensitivity to any materials used to complete the sterilization method). However, certain conditions place a woman at high surgical risk; in these cases, careful consideration should be given to the risks and benefits of other acceptable alternatives, including long-acting, highly effective, reversible methods and vasectomy. Female and male sterilization do not protect against sexually transmitted infections (STIs) or human immunodeficiency virus (HIV). If risk exists for STI/HIV (including during pregnancy or postpartum), the correct and consistent use of condoms is recommended, either alone or with another contraceptive method. Consistent and correct use of the male latex condom reduces the risk for STIs and HIV transmission.

Because these methods are intended to be irreversible, persons who choose sterilization should be certain that they want to prevent pregnancy permanently. Most persons who choose sterilization remain satisfied with their decision. However, a small proportion of women regret this decision (1%–26% from different studies, with higher rates of regret reported by women who were younger at sterilization) (*1*,*2*). Regret among men about vasectomy has been reported to be approximately 5% (*3*), similar to the proportion of women who report regretting their husbands' vasectomy (6%) (*4*). Therefore, all persons should be appropriately counseled about the permanency of sterilization and the availability of highly effective, reversible methods of contraception.

References

1. Peterson HB. Sterilization. Obstet Gynecol 2008;111:189–203.
2. Hillis SD, Marchbanks PA, Tylor LR, Peterson HB. Poststerilization regret: findings from the United States Collaborative Review of Sterilization. Obstet Gynecol 1999;93:889–95.
3. Ehn BE, Liljestrand J. A long-term follow-up of 108 vasectomized men. Good counselling routines are important. Scand J Urol Nephrol 1995;29:477–81.
4. Jamieson DJ, Kaufman SC, Costello C, et al. A comparison of women's regret after vasectomy versus tubal sterilization. Obstet Gynecol 2002;99:1073–9.

Appendix L

Summary of Classifications for Hormonal Contraceptive Methods and Intrauterine Devices

Health-care providers can use the summary table as a quick reference guide to the classifications for hormonal contraceptive methods and intrauterine contraception and to compare classifications across these methods. See the full appendix for each method for clarifications to the numeric categories, as well as for summaries of the evidence and additional comments.

BOX. Categories for Classifying Hormonal Contraceptives and IUDs

1 = A condition for which there is no restriction for the use of the contraceptive method.
2 = A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.
3 = A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.
4 = A condition that represents an unacceptable health risk if the contraceptive method is used.

TABLE. Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD	Cu-IUD
Personal Characteristics and Reproductive History						
Pregnancy	Not applicable†	Not applicable†	Not applicable†	Not applicable†	4†	4†
Age	Menarche to <40 yrs = 1 ≥40 yrs = 2	Menarche to <18 yrs = 1 18–45 yrs = 1 >45 yrs = 1	Menarche to <18 yrs = 2 18–45 yrs = 1 >45 yrs = 1	Menarche to <18 yrs =1 18–45 yrs = 1 >45 yrs = 1	Menarche to <20 yrs = 2 ≥20 yrs = 1	Menarche to <20 yrs = 2 ≥20 yrs = 1
Parity						
a. Nulliparous	1	1	1	1	2	2
b. Parous	1	1	1	1	1	1
Breastfeeding						
a. <1 mo postpartum	3†	2†	2†	2†		
b. 1 mo to <6 mos	2†	1†	1†	1†		
c. ≥6 mos postpartum	2†	1†	1†	1†		
Postpartum (nonbreastfeeding women)						
a. <21 days	3	1	1	1		
b. ≥21 days	1	1	1	1		
Postpartum (breastfeeding or nonbreastfeeding women, including post-Cesarean section)						
a. <10 min after delivery of the placenta					2	1
b. 10 min after delivery of the placenta to <4 wks					2	2
c. ≥4 wks					1	1
d. Puerperal sepsis					4	4
Postabortion						
a. First trimester	1†	1†	1†	1†	1†	1†
b. Second trimester	1†	1†	1†	1†	2	2
c. Immediate postseptic abortion	1†	1†	1†	1†	4	4
Past ectopic pregnancy	1	2	1	1	1	1
History of pelvic surgery (see postpartum, including Cesarean section)	1	1	1	1	1	1
Smoking						
a. Age <35 yrs	2	1	1	1	1	1
b. Age ≥35 yrs						
i. <15 Cigarettes/day	3	1	1	1	1	1
ii. ≥15 Cigarettes/day	4	1	1	1	1	1

TABLE. (*Continued*) Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD	Cu-IUD
Obesity						
a. ≥30 kg/m² BMI	2	1	1	1	1	1
b. Menarche to <18 yrs and ≥30 kg/m² BMI	2	1	2	1	1	1
History of bariatric surgery§						
a. Restrictive procedures: decrease storage capacity of the stomach (vertical banded gastroplasty, laparoscopic adjustable gastric band, laparoscopic sleeve gastrectomy)	1	1	1	1	1	1
b. Malabsorptive procedures: decrease absorption of nutrients and calories by shortening the functional length of the small intestine (Roux-en-Y gastric bypass, biliopancreatic diversion)	COCs: 3 P/R: 1	3	1	1	1	1
Cardiovascular Disease						
Multiple risk factors for arterial cardiovascular disease (such as older age, smoking, diabetes, and hypertension)	3/4†	2†	3†	2†	2	1
Hypertension						
a. Adequately controlled hypertension	3†	1†	2†	1†	1	1
b. Elevated blood pressure levels (properly taken measurements)						
i. Systolic 140–159 mm Hg or diastolic 90–99 mm Hg	3	1	2	1	1	1
ii. Systolic ≥160 mm Hg or diastolic ≥100 mm Hg§	4	2	3	2	2	1
c. Vascular disease	4	2	3	2	2	1
History of high blood pressure during pregnancy (where current blood pressure is measurable and normal)	2	1	1	1	1	1
Deep venous thrombosis (DVT)/ pulmonary embolism (PE)						
a. History of DVT/PE, not on anticoagulant therapy						
i. Higher risk for recurrent DVT/PE (≥1 risk factors) • History of estrogen-associated DVT/PE • Pregnancy-associated DVT/PE • Idiopathic DVT/PE • Known thrombophilia, including antiphospholipid syndrome • Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer • History of recurrent DVT/PE	4	2	2	2	2	1
ii. Lower risk for recurrent DVT/PE (no risk factors)	3	2	2	2	2	1
b. Acute DVT/PE	4	2	2	2	2	2
c. DVT/PE and established on anticoagulant therapy for at least 3 mos						
i. Higher risk for recurrent DVT/PE (≥1 risk factors) • Known thrombophilia, including antiphospholipid syndrome • Active cancer (metastatic, on therapy, or within 6 mos after clinical remission), excluding non-melanoma skin cancer • History of recurrent DVT/PE	4†	2	2	2	2	2
ii. Lower risk for recurrent DVT/PE (no risk factors)	3†	2	2	2	2	2

TABLE. (*Continued*) Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD	Cu-IUD
d. Family history (first-degree relatives)	2	1	1	1	1	1
e. Major surgery						
i. With prolonged immobilization	4	2	2	2	2	1
ii. Without prolonged immobilization	2	1	1	1	1	1
f. Minor surgery without immobilization	1	1	1	1	1	1
Known thrombogenic mutations§ (e.g. factor V Leiden; prothrombin mutation; protein S, protein C, and antithrombin deficiencies)	4†	2†	2†	2†	2†	1†
Superficial venous thrombosis						
a. Varicose veins	1	1	1	1	1	1
b. Superficial thrombophlebitis	2	1	1	1	1	1
Current and history of ischemic heart disease§		Initiation Continuation		Initiation Continuation	Initiation Continuation	
	4	2 3	3	2 3	2 3	1
Stroke§ (history of cerebrovascular accident)		Initiation Continuation		Initiation Continuation		
	4	2 3	3	2 3	2	1
Known hyperlipidemias	2/3†	2†	2†	2†	2†	1†
Valvular heart disease						
a. Uncomplicated	2	1	1	1	1	1
b. Complicated§ (pulmonary hypertension, risk for atrial fibrillation, history of subacute bacterial endocarditis)	4	1	1	1	1	1
Peripartum cardiomyopathy§						
a. Normal or mildly impaired cardiac function (New York Heart Association Functional Class I or II: patients with no limitation of activities or patients with slight, mild limitation of activity) (*1*)						
i. <6 mos	4	1	1	1	2	2
ii. ≥6 mos	3	1	1	1	2	2
b. Moderately or severely impaired cardiac function (New York Heart Association Functional Class III or IV: patients with marked limitation of activity or patients who should be at complete rest) (*1*)	4	2	2	2	2	2
Rheumatic Diseases						
Systemic lupus erythematosus§			Initiation Continuation			Initiation Continuation
a. Positive (or unknown) antiphospholipid antibodies	4	3	3 3	3	3	1 1
b. Severe thrombocytopenia	2	2	3 2	2	2†	3† 2†
c. Immunosuppressive treatment	2	2	2 2	2	2	2 1
d. None of the above	2	2	2 2	2	2	1 1
Rheumatoid arthritis					Initiation Continuation	Initiation Continuation
a. On immunosuppressive therapy	2	1	2/3†	1	2 1	2 1
b. Not on immunosuppressive therapy	2	1	2	1	1	1
Neurologic Conditions						
Headaches	Initiation Continuation	Initiation Continuation	Initiation Continuation	Initiation Continuation	Initiation Continuation	
a. Non-migrainous (mild or severe)	1† 2†	1† 1†	1† 1†	1† 1†	1† 1†	1†
b. Migraine						
i. Without aura						
• Age <35 yrs	2† 3†	1† 2†	2† 2†	2† 2†	2† 2†	1†
• Age ≥35 yrs	3† 4†	1† 2†	2† 2†	2† 2†	2† 2†	1†
ii. With aura (at any age)	4† 4†	2† 3†	2† 3†	2† 3†	2† 3†	1†
Epilepsy§	1†	1†	1†	1†	1	1

If on treatment, see Drug Interactions section below

TABLE. (*Continued*) Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD		Cu-IUD	
Depressive Disorders								
Depressive disorders	1†	1†	1†	1†	1†		1†	
Reproductive Tract Infections and Disorders								
Vaginal bleeding patterns					Initiation	Continuation		
a. Irregular pattern without heavy bleeding	1	2	2	2	1	1	1	
b. Heavy or prolonged bleeding (includes regular and irregular patterns)	1†	2†	2†	2†	1†	2†	2†	
Unexplained vaginal bleeding (suspicious for serious condition)					Initiation	Continuation	Initiation	Continuation
Before evaluation	2†	2†	3†	3†	4†	2†	4†	2†
Endometriosis	1	1	1	1	1		2	
Benign ovarian tumors (including cysts)	1	1	1	1	1		1	
Severe dysmenorrhea	1	1	1	1	1		2	
Gestational trophoblastic disease								
a. Decreasing or undetectable ß-hCG levels	1	1	1	1	3		3	
b. Persistently elevated ß-hCG levels or malignant disease§	1	1	1	1	4		4	
Cervical ectropion	1	1	1	1	1		1	
Cervical intraepithelial neoplasia	2	1	2	2	2		1	
Cervical cancer (awaiting treatment)					Initiation	Continuation	Initiation	Continuation
	2	1	2	2	4	2	4	2
Breast disease								
a. Undiagnosed mass	2†	2†	2†	2†	2		1	
b. Benign breast disease	1	1	1	1	1		1	
c. Family history of cancer	1	1	1	1	1		1	
d. Breast cancer§								
i. Current	4	4	4	4	4		1	
ii. Past and no evidence of current disease for 5 yrs	3	3	3	3	3		1	
Endometrial hyperplasia	1	1	1	1	1		1	
Endometrial cancer§					Initiation	Continuation	Initiation	Continuation
	1	1	1	1	4	2	4	2
Ovarian cancer§	1	1	1	1	1		1	
Uterine fibroids	1	1	1	1	2		2	
Anatomical abnormalities								
a. Distorted uterine cavity (any congenital or acquired uterine abnormality distorting the uterine cavity in a manner that is incompatible with IUD insertion)					4		4	
b. Other abnormalities (including cervical stenosis or cervical lacerations) not distorting the uterine cavity or interfering with IUD insertion					2		2	
Pelvic inflammatory disease (PID)								
a. Past PID (assuming no current risk factors of STIs)					Initiation	Continuation	Initiation	Continuation
i. With subsequent pregnancy	1	1	1	1	1	1	1	1
ii. Without subsequent pregnancy	1	1	1	1	2	2	2	2
b. Current PID	1	1	1	1	4	2†	4	2†

TABLE. (*Continued*) Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD		Cu-IUD	
STIs					Initiation	Continuation	Initiation	Continuation
a. Current purulent cervicitis or chlamydial infection or gonorrhea	1	1	1	1	4	2†	4	2†
b. Other STIs (excluding HIV and hepatitis)	1	1	1	1	2	2	2	2
c. Vaginitis (including *Trichomonas vaginalis* and bacterial vaginosis)	1	1	1	1	2	2	2	2
d. Increased risk for STIs	1	1	1	1	2/3†	2	2/3†	2
HIV/AIDS					Initiation	Continuation	Initiation	Continuation
High risk for HIV	1	1	1	1	2	2	2	2
HIV infection§	1	1	1	1	2	2	2	2
AIDS§	1†	1†	1†	1†	3	2†	3	2†
Clinically well on ARV therapy	If on treatment, see Drug Interactions section below				2	2	2	2
Other Infections								
Schistosomiasis								
a. Uncomplicated	1	1	1	1	1		1	
b. Fibrosis of the liver (if severe, see Cirrhosis)§	1	1	1	1	1		1	
Tuberculosis§					Initiation	Continuation	Initiation	Continuation
a. Nonpelvic	1†	1†	1†	1†	1	1	1	1
b. Pelvic	1†	1†	1†	1†	4	3	4	3
	If on treatment, see Drug Interactions section below							
Malaria	1	1	1	1	1		1	
Endocrine Conditions								
Diabetes								
a. History of gestational disease	1	1	1	1	1		1	
b. Nonvascular disease								
i. Noninsulin-dependent	2	2	2	2	2		1	
ii. Insulin-dependent§	2	2	2	2	2		1	
c. Nephropathy/retinopathy/neuropathy§	3/4†	2	3	2	2		1	
d. Other vascular disease or diabetes of >20 yrs' duration§	3/4†	2	3	2	2		1	
Thyroid disorders								
a. Simple goiter	1	1	1	1	1		1	
b. Hyperthyroid	1	1	1	1	1		1	
c. Hypothyroid	1	1	1	1	1		1	
Gastrointestinal Conditions								
Inflammatory bowel disease (IBD) (ulcerative colitis, Crohn disease)	2/3†	2	2	1	1		1	
Gallbladder disease								
a. Symptomatic								
i. Treated by cholecystectomy	2	2	2	2	2		1	
ii. Medically treated	3	2	2	2	2		1	
iii. Current	3	2	2	2	2		1	
b. Asymptomatic	2	2	2	2	2		1	
History of cholestasis								
a. Pregnancy-related	2	1	1	1	1		1	
b. Past COC-related	3	2	2	2	2		1	
Viral hepatitis	Initiation	Continuation						
a. Acute or flare	3/4†	2	1	1	1		1	
b. Carrier	1	1	1	1	1		1	
c. Chronic	1	1	1	1	1		1	
Cirrhosis								
a. Mild (compensated)	1		1	1	1		1	
b. Severe§ (decompensated)	4		3	3	3		1	

TABLE. (*Continued*) Summary of classifications for hormonal contraceptive methods and intrauterine devices*

Condition	COC/P/R	POP	DMPA	Implants	LNG-IUD		Cu-IUD	
Liver tumors								
a. Benign								
i. Focal nodular hyperplasia	2	2	2	2	2		1	
ii. Hepatocellular adenoma§	4	3	3	3	3		1	
b. Malignant§ (hepatoma)	4	3	3	3	3		1	
Anemias								
Thalassemia	1	1	1	1	1		2	
Sickle cell disease§	2	1	1	1	1		2	
Iron-deficiency anemia	1	1	1	1	1		2	
Solid Organ Transplantation								
Solid organ transplantation§					Initiation	Continuation	Initiation	Continuation
a. Complicated: graft failure (acute or chronic), rejection, cardiac allograft vasculopathy	4	2	2	2	3	2	3	2
b. Uncomplicated	2†	2	2	2	2		2	
Drug Interactions								
Antiretroviral therapy (see appendix M)					Initiation	Continuation	Initiation	Continuation
a. Nucleoside reverse transcriptase inhibitors (NRTIs)	1†	1	1	1	2/3†	2†	2/3†	2†
b. Non-nucleoside reverse transcriptase inhibitors (NNRTIs)	2†	2†	1	2†	2/3†	2†	2/3†	2†
c. Ritonavir-boosted protease inhibitors	3†	3†	1	2†	2/3†	2†	2/3†	2†
Anticonvulsant therapy								
a. Certain anticonvulsants (phenytoin, carbamazepine, barbiturates, primidone, topiramate, oxcarbazepine)	3†	3†	1	2†	1		1	
b. Lamotrigine	3†	1	1	1	1		1	
Antimicrobial therapy								
a. Broad-spectrum antibiotics	1	1	1	1	1		1	
b. Antifungals	1	1	1	1	1		1	
c. Antiparasitics	1	1	1	1	1		1	
d. Rifampicin or rifabutin therapy	3†	3†	1	2†	1		1	

* Abbreviations: COC = combined oral contraceptive; P = combined hormonal contraceptive patch; R = combined hormonal vaginal ring; POP = progestin-only pill; DMPA = depot medroxyprogesterone acetate; IUD = intrauterine device; LNG-IUD = levonorgestrel-releasing IUD; Cu-IUD = copper IUD; BMI = body mass index; DVT = deep venous thrombosis; PE = pulmonary embolism; hCG, = human chorionic gonadotropin; PID = pelvic inflammatory disease; STI = sexually transmitted infection; HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase.
† Consult the appendix for this contraceptive method for a clarification to this classification.
§ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

Reference

1. The Criteria Committee of the New York Heart Association. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels. 9th ed. Boston, MA: Little, Brown & Co.; 1994.

Appendix M

Summary of Evidence Regarding Potential Drug Interactions between Hormonal Contraception and Antiretroviral Therapies

Limited data from small, mostly unpublished studies suggest that some antiretroviral (ARV) therapies might alter the pharmacokinetics of combined oral contraceptives (COCs). Few studies have measured clinical outcomes. However, contraceptive steroid levels in the blood decrease substantially with ritonavir-boosted protease inhibitors. Such decreases have the potential to compromise contraceptive effectiveness. Some of the interactions between contraceptives and ARVs also have led to increased ARV toxicity. For smaller effects that occur with non-nucleoside reverse transcriptase inhibitors, clinical significance is unknown, especially because studies have not examined steady-state levels of contraceptive hormones. No clinically significant interactions have been reported between contraceptive hormones and nucleoside reverse transcriptase inhibitors.

Tables 1 and 2 summarize the evidence available about drug interactions between ARV therapies and hormonal contraceptives. For up-to-date, detailed information about human immunodeficiency virus (HIV) drug interactions, the following resources might be helpful:

- *Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents* from the DHHS Panel on Antiretroviral Guidelines for Adults and Adolescents. Available at http://aidsinfo.nih.gov/contentfiles/AdultandAdolescentGL.pdf.
- HIV Drug Interactions website, University of Liverpool, UK. Available at www.hiv-druginteractions.org.

TABLE 1. Drug interactions between COCs and ARV drugs*

ARV	Contraceptive effects†	ARV effects†
Nucleoside reverse transcriptase inhibitors (NRTIs)		
Tenofovir disaproxil fumarate	EE ↔, NGM ↔ (*1*)	Tenofovir ↔ (*1*)
Zidovudine	No data	Zidovudine ↔ (*2*) No change in viral load or CD4+ (*2*)
Non-nucleoside reverse transcriptase inhibitors (NNRTIs)		
Efavirenz	EE ↑ (*3*), EE ↔ (*4*), NGM ↓ (*4*), LNG ↓ (*4*) Pregnancy rate 2.6/100 woman-years in 1 study in which up to 80% used hormonal contraceptives (35% used COC) (*5*)	Efavirenz ↔ (*3,4*)
Etravirine	EE ↔, NET ↔ (*6*)	Etravirine ↑ (*6*) Concurrent administration, generally safe and well tolerated (*6*)
Nevirapine	EE ↔, NET ↔ (*7*)	Nevirapine ↔ (*7*)
Protease inhibitors and ritonavir-boosted protease inhibitors		
Atazanavir/ritonavir	EE ↑, NET ↑ (*8*)	No data
Darunavir/ritonavir	EE ↓, NET ↔ (*9*)	Darunavir ↔ (*9*)
Fos-amprenavir/ritonavir	EE ↓ (*10,11*), NET ↓ (*11*)	Amprenavir ↔, ritonavir ↑, Elevated liver transaminases (*10*)
Indinavir§	EE ↔, NET ↔ (*12*)	No data
Lopinavir/ritonavir	EE ↓, NET ↔ (*13*)	No data
Nelfinavir	EE ↓, NET ↔ (*14*)	No data
Saquinavir§	No data	Saquinavir ↔ (*15,16*)
Tipranavir/ritonavir	EE↓ (*17*)	↑ Skin and musculoskeletal adverse events; possible drug hypersensitivity reaction (*17*)

* Abbreviations: COC = combined oral contraceptive; ARV = antiretroviral; EE = ethinyl estradiol; NGM = norgestimate; NNRTI = non-nucleoside reverse transcriptase inhibitor; LNG = levonorgestrel; NET = norethindrone.
† ↔, no change or change ≤30%; ↑, increase >30%; ↓, decrease >30%.
§ Saquinavir and indinavir are commonly given boosted by ritonavir, but there are no data on contraceptive interactions with the boosted regimens.

TABLE 2. Drug interactions between DMPA and ARV drugs*

ARV	Contraceptive effects†	ARV effects†
Nucleoside reverse transcriptase inhibitors (NRTIs)		
Zidovudine	No data	Zidovudine ↔ (*2*) No change in viral load
Non-nucleoside reverse transcriptase inhibitors (NNRTIs)		
Efavirenz	MPA ↔ (*18,19*) No ovulations during 3 cycles(*18,19*) Pregnancy rate 2.6/100 woman-years in 1 study where up to 80% used hormonal contraceptives (65% used POIs) (*5*)	Efavirenz ↔ (*18*) No change in viral load or CD4+, no grade 3- or 4-related adverse events§ (*20*)
Nevirapine	MPA ↔ (*18*) No ovulations during 3 cycles(*18*)	Nevirapine ↑ (*18*) No change in viral load or CD4+, no grade 3- or 4-related adverse events§ (*20*)
Protease inhibitors and ritonavir-boosted protease inhibitors		
Nelfinavir	MPA ↔ (*18*)	Nelfinavir ↔ (*18*) No change in viral load or CD4+, no grade 3- or 4-related adverse events§ (*20*)

* Abbreviations: DMPA = depot medroxyprogesterone acetate; ARV = antiretroviral; NRTI = nucleoside reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase; MPA = medroxyprogesterone acetate; POI = progestin-only injectables.

† ↔, no change or change ≤30%; ↑, increase > 30%.

§ The trial applied the standardized National Institutes of Health Division of AIDS Table for Grading Severity of Adult and Pediatric Adverse Events, 2004 (http://rcc.tech-res.com/Document/safetyandpharmacovigilance/DAIDS_AE_GradingTable_Clarification_August2009_Final.pdf). Grade 3 events are classified as severe. Severe events are defined as symptoms that limit activity or might require some assistance; require medical intervention or therapy; and might require hospitalization. Grade 4 events are classified as life threatening. Life-threatening events include symptoms that result in extreme limitation of activity and require substantial assistance; require substantial medical intervention and therapy; and probably require hospitalization or hospice.

References

1. Kearney BP, Isaacson E, Sayre J, Cheng AK. Tenofovir DF and oral contraceptives: lack of a pharmacokinetic drug interaction [Abstract A-1618]. In: Program and abstracts of the 43rd Interscience Conference on Antimicrobial Agents and Chemotherapy, Chicago, IL, September 14–17, 2003. Washington, DC: American Society for Microbiology; 2003.
2. Aweeka FT, Rosenkranz SL, Segal Y, et al. The impact of sex and contraceptive therapy on the plasma and intracellular pharmacokinetics of zidovudine. AIDS 2006;20:1833–41.
3. Joshi AS, Fiske WD, Benedek IH, et al. Lack of a pharmacokinetic interaction between efavirenz (DMP 266) and ethinyl estradiol in healthy female volunteers [Abstract 348]. 5th Conference on Retroviruses and Opportunistic Infections, Chicago, IL, February 1–5, 1998.
4. Sevinsky H, Eley T, He B, et al. Effect of efavirenz on the pharacokinetics of ethinyl estradiol and norgestimate in healthy female subjects [Abstract A958]. In: Program and abstracts of the 48th Interscience Conference on Antimicrobial Agents and Chemotherapy, Washington, DC, October 25–28, 2008. Washington, DC: American Society for Microbiology; 2008.
5. Danel C, Moh R, Anzian A, et al. Tolerance and acceptability of an efavirenz-based regimen in 740 adults (predominantly women) in West Africa. J Acquir Immune Defic Syndr 2006;42:29–35.
6. Scholler-Gyure M, Debroye C, Aharchi F, et al. No clinically relevant effect of TMC125 on the pharmacokinetics of oral contraceptives. 8th International Congress on Drug Therapy in HIV Infection, Glasgow, UK, November 12–16, 2006..
7. Mildvan D, Yarrish R, Marshak A, et al. Pharmacokinetic interaction between nevirapine and ethinyl estradiol/norethindrone when administered concurrently to HIV-infected women. J Acquir Immune Defic Syndr 2002;29:471–7.
8. Zhang J, Chung E, Eley T et al. Effect of atazanavir/ritonavir on the pharmacokinetics of ethinyl estradiol and 17-deactyl-norgestimate in healthy female subjects [Abstract A-1415]. In: Program and abstracts of the 47th Interscience Conference on Antimicrobial Agents and Chemotherapy, Chicago, IL, September 17–20, 2007. Washington, DC: American Society for Microbiology; 2009.
9. Sekar V, Lefebvre E S-GSeal. Pharacokinetic interaction between nevirapine and ethinyl estradiol, norethindrone, and TMC114, a new protease inhibitor [Abstract A-368]. In: Program and abstracts of the 46th Interscience Conference on Antimicrobial Agents and Chemotherapy, San Francisco, CA, September 27–30, 2006. Washington, DC: American Society for Microbiology; 2009.
10. Glaxo Smith Kline. Prescription medicines. Lexiva (fosamprenavir calcium). Glaxo Smith Kline 2009. Available from http://us.gsk.com/products/assets/us_lexiva.pdf. Accessed March 15, 2010.
11. Glaxo Smith Kline. Study APV10020. A phase I, open label, two period, single-sequence, drug-drug interaction study comparing steady-state plasma ethinyl estradiol and norethisterone pharmacokinetics following administration of brevinor for 21 days with and without fosamprenavir 700 mg twice daily (BID) and ritonavir 100 mg (BID) for 21 days in healthy adult female subjects. Glaxo Smith Kline 2009. Available from http://www.gsk-clinicalstudyregister.com/files/pdf/23138.pdf. Accessed March 15, 2010.
12. Merck & Company. Indinavir patient prescribing information. Merck & Company 2009. Available from http://www.merck.com/product/usa/pi_circulars/c/crixivan/crixivan_pi.pdf. Accessed March 15, 2010.
13. Abbott Laboratories. Lopinavir and ritonavir prescribing information, 2009. Abbott Laboratories 2009. Available from http://www.rxabbott.com/pdf/kaletratabpi.pdf. Accessed March 15, 2010.
14. Agouron Pharmaceuticals. Viracept (Nelfinavir mesylate) prescribing information, 2008. Agouron Pharmaceuticals 2009. Available from http://us.gsk.com/products/assets/us_viracept.pdf. Accessed March 15, 2010.

15. Mayer K, Poblete R, Hathaway B et al. Efficacy, effect of oral contraceptives, and adherence in HIV infected women receiving Fortovase (Saquinavir) soft gel capsule (SQV-SGC; FTV) thrice (TID) and twice (BID) daily regimens. XIII International AIDS Conference, 2000, Durban, South Africa 2009.
16. Frohlich M, Burhenne J, Martin-Facklam M, et al. Oral contraception does not alter single dose saquinavir pharmacokinetics in women. Br J Clin Pharmacol 2004;57:244–52.
17. Food and Drug Administration. Highlights of prescribing information. Aptivus (Tipranavir) Capsules. USFDA 2009. Available from http://www.accessdata.fda.gov/drugsatfda_docs/label/2008/021814s005,022292lbl.pdf.
18. Cohn SE, Park JG, Watts DH, et al. Depo-medroxyprogesterone in women on antiretroviral therapy: effective contraception and lack of clinically significant interactions. Clin Pharmacol Ther 2007;81:222–7.
19. Nanda K, Amaral E, Hays M, et al. Pharmacokinetic interactions between depot medroxyprogesterone acetate and combination antiretroviral therapy. Fertil Steril 2008;90:965–71.
20. Watts DH, Park JG, Cohn SE, et al. Safety and tolerability of depot medroxyprogesterone acetate among HIV-infected women on antiretroviral therapy: ACTG A5093. Contraception 2008;77:84–90.

Abbreviations and Acronyms

A	accept
AIDS	acquired immunodeficiency syndrome
ARV	antiretroviral
BMD	bone mineral density
BMI	body mass index
C	caution
CDC	Centers for Disease Control and Prevention
CHC	combined hormonal contraceptive
CI	coitus interruptus
COC	combined oral contraceptive
Cu-IUD	copper intrauterine device
D	delayed
DMPA	depot medroxyprogesterone acetate
DVT	deep venous thrombosis
ECP	emergency contraceptive pills
EE	ethinyl estradiol
E-IUD	emergency intrauterine device
ETG	etonogestrel
FAB	fertility awareness–based methods
hCG	human chorionic gonadotropin
HDL	high-density lipoprotein
HIV	human immunodeficiency virus
HPV	human papillomavirus
IBD	inflammatory bowel disease
IUS	intrauterine system
IUD	intrauterine device
LNG	levonorgestrel
LNG-IUD	levonorgestrel-releasing intrauterine device
MEC	Medical Eligibility Criteria
NET-EN	norethisterone enantate
NGM	norgestimate
NNRTI	non-nucleoside reverse transcriptase inhibitor
NRTI	nucleoside reverse transcriptase inhibitor
P	combined hormonal contraceptive patch
PE	pulmonary embolism
PID	pelvic inflammatory disease
POC	progestin-only contraceptive
POI	progestin-only injectable
POP	progestin-only pill
R	combined hormonal vaginal ring
SLE	systemic lupus erythematosus
STI	sexually transmitted infection
VTE	venous thromboembolism
WHO	World Health Organization

U.S. Medical Eligibility Criteria for Contraceptive Use, 2010

Atlanta, GA, February 17–19, 2009

Chairpersons: Herbert B. Peterson, MD, University of North Carolina, Chapel Hill, North Carolina; Kathryn M. Curtis, PhD, Centers for Disease Control and Prevention, Atlanta, Georgia.

CDC Steering Committee: Kathryn M. Curtis, PhD (Chair), Denise Jamieson, MD, John Lehnherr, Polly Marchbanks, PhD, Centers for Disease Control and Prevention, Atlanta, Georgia.

Systematic Review Authors and Presenters: Sherry Farr, PhD, Suzanne Gaventa Folger, PhD, Melissa Paulen, MPH, Naomi Tepper, MD, Maura Whiteman, PhD, Lauren Zapata, PhD, Centers for Disease Control and Prevention, Atlanta, Georgia; Kelly Culwell, MD, Nathalie Kapp, MD, World Health Organization, Geneva, Switzerland; Catherine Cansino, MD, Johns Hopkins Bayview Medical Center, Baltimore, Maryland.

Invited Participants: Abbey Berenson, MD, University of Texas Medical Branch, Nassau Bay, Texas; Paul Blumenthal, MD, Stanford University, Palo Alto, California (not able to attend); Willard Cates, Jr., MD, Family Health International, Research Triangle Park, North Carolina (not able to attend); Mitchell Creinin, MD, University of Pittsburgh, Pittsburgh, Pennsylvania; Vanessa Cullins, MD, Planned Parenthood Federation of America, New York, New York; Philip Darney, MD, University of California, San Francisco, California; Jennifer Dietrich, MD, Baylor College of Medicine, Houston, Texas; Linda Dominguez, Southwest Women's Health, Albuquerque, New Mexico; Melissa Gilliam, MD, The University of Chicago, Chicago, Illinois; Marji Gold, MD, Albert Einstein College of Medicine, Bronx, New York; Alisa Goldberg, MD, Brigham and Women's Hospital and Planned Parenthood of Massachusetts, Boston, Massachusetts; David Grimes, MD, Family Health International, Research Triangle Park, North Carolina (not able to attend); Robert Hatcher, MD, Emory University, Atlanta, Georgia; Stephen Heartwell, DrPH, Susan Thompson Buffett Foundation, Omaha, Nebraska; Andrew Kaunitz, MD, University of Florida, Jacksonville, Florida; Uta Landy, PhD, University of California, San Francisco, California (not able to attend); Hal Lawrence, MD, American College of Obstetricians and Gynecologists, Washington, DC; Ruth Lawrence, MD, American Academy of Pediatrics and University of Rochester, Rochester, New York; Laura MacIsaac, MD, Albert Einstein School of Medicine, New York, New York; Trent MacKay, MD, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, MD (not able to attend); Daniel Mishell, Jr, MD, University of Southern California, Los Angeles, California; Mary Mitchell, American College of Obstetricians and Gynecologists, Washington, DC; Susan Moskosky, MS, US Department of Health and Human Services, Rockville, Maryland; Patricia Murphy, DrPH, University of Utah, Salt Lake City, Utah; Kavita Nanda, MD, Family Health International, Research Triangle Park, North Carolina; Jeffrey Peipert, MD, Washington University, St. Louis, Missouri; Michael Policar, MD, University of California, San Francisco, California; Robert Rebar, MD, American Society of Reproductive Medicine, Birmingham, Alabama; Pablo Rodriquez, MD, Providence, Rhode Island (not able to attend); John Santelli, MD, Columbia University, New York, New York (not able to attend); Sharon Schnare, MSN, University of Washington, Seattle, Washington; David Soper, MD, University of South Carolina, Charleston, South Carolina; Lisa Soule, MD, Food and Drug Administration, Silver Spring, Maryland; James Trussell, PhD, Princeton University, Princeton, New Jersey; Carolyn Westhoff, MD, Columbia University, New York, New York (not able to attend); Susan Wysocki, National Association of Nurse Practitioners in Women's Health, Washington, DC; Mimi Zieman, MD, Emory University, Atlanta, Georgia.

Consultants: Wendy Book, MD, Emory University, Atlanta, Georgia; Shinya Ito, Hospital for Sick Children, Toronto, Canada; Beth Jonas, MD, University of North Carolina, Chapel Hill, North Carolina; Miriam Labbok, MD, University of North Carolina, Chapel Hill, North Carolina; Frederick Naftolin, MD, New York University, New York, New York; Lubna Pal, Yale University, New Haven, Connecticut; Robin Rutherford, MD, Emory University, Atlanta, Georgia; Roshan Shrestha, MD, Piedmont Hospital, Atlanta, Georgia; Kimberley Steele, MD, Johns Hopkins University, Baltimore, Maryland; Michael Streiff, MD, Johns Hopkins University, Baltimore, Maryland; Christine Wagner, PhD, University of Albany, Albany, New York; Joan Walker, MD, University of Oklahoma, Oklahoma City, Oklahoma.

CDC Attendees: Janet Collins, PhD, Susan Hillis, PhD, Dmitry Kissin MD, Sam Posner, PhD, Natalya Revzina, MD, Cheryl Robbins, PhD, Lee Warner, PhD.

This work was conducted within the Women's Health and Fertility Branch (Maurizio Macaluso, Branch Chief), in the Division of Reproductive Health (John Lehnherr, Acting Director), National Center for Chronic Disease Prevention and Health Promotion (Ursula Bauer, Director).

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, visit *MMWR*'s free subscription page at *http://www.cdc.gov/mmwr/mmwrsubscribe.html*. Paper copy subscriptions are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone 202-512-1800.

Data presented by the Notifiable Disease Data Team and 122 Cities Mortality Data Team in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. Address all inquiries about the *MMWR* Series, including material to be considered for publication, to Editor, *MMWR* Series, Mailstop E-90, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333 or to *mmwrq@cdc.gov*.

☆U.S. Government Printing Office: 2010-623-026/41253 Region IV ISSN: 1057-5987